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**Early Childhood Development and Education in China:
Breaking the Cycle of Poverty and
Improving Future Competitiveness**

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ACRONYMS AND ABBREVIATIONS

ACFW	All-China Federation of Women	MHRSS	Ministry of Human Resources and Social Security
BRIC	Brazil, Russia, India and China	NBS	National Bureau of Statistics
		NER	Net Enrolment Ratio
ECDE	Early Childhood Development and Education	NPC	National People's Congress
CCTV	China Central Television Station	NPFPC	National Population and Family Planning Commission
CDC	China Center for Disease Prevention and Control	NPPCC	National People's Political Consultative Council
FYP	Five Year Plan		National Working Committee for Women and Children
GDP	Gross Domestic Product	NWCCW	
GER	Gross Enrolment Ratio	OECD	Organization for Economic Cooperation and Development
MOCA	Ministry of Civil Affairs	PISA	Programme for International Student Assessment
MOE	Ministry of Education	UNICEF	United Nation Children's Fund
MOH	Ministry of Health	UNDP	United National Development Program
MOF	Ministry of Finance	WHO	World Health Organization

Country Director:	Klaus Rohland
Sector Director:	Emmanuel Jimenez
Sector Manager:	Eduardo Velez Bustillo
Task Team Leader:	Kin Bing Wu

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Abstract

Neuroscience and longitudinal studies of early childhood development and education (ECDE) found that prenatal care and experiences from birth to the first six years (0-6), affect physical and brain development of children, and thereby the cognitive and socio-emotional development in subsequent stages of their lives. Lack of access to nutrition and health care, insufficient stimulating human interaction, and non-enrollment in pre-primary education are associated with lower educational attainment and achievement, which, in turn, reduce life-time earnings and potentially contribute to disruptive behavior to society. Investing in ECDE yields the highest economic returns because early learning and formation of good habits and social skills are far more productive than later, remedial education and training. The internal rates of return of rigorously evaluated ECDE programs range from 7 percent to 18 percent, which are higher than the rates of return to financial capital. Investments in ECDE are one of the most cost-effective strategies to break the inter-generational transmission of poverty, and to improve productivity and social cohesion in the long run.

Given China's goal to develop a harmonious society and to improve the competitiveness of its future workforce in order to overcome the challenges of an aging population and move towards a high-income society, there is an urgent need to identify the gap in its human development strategy. Since China has universalized nine years of compulsory education and has rapidly increased enrollment in post-compulsory education, the major gap is in provision of services for the 0-6 age group. This policy note reviews the development status of the 0-6-year-olds, assesses the equity of access to services in light of public and private finance, and explores policy options to serve children who are denied access to services because of the lack of supply, or parents' inability to pay. The note draws from national and international data to benchmark progress and identify gaps. It uses household-level data from a survey in Hunan Province to explore policy options.

Although China has made enormous progress in maternal and child health and has reached 51 percent gross enrollment for the 3-6 age group, rural children are under served, particularly the extremely poor and ethnic minorities. The 0-3 age-group is also underserved. A multivariate analysis found that enrollment in kindergartens, access to health check-up, nutrition, caregivers' access to information, and good parenting (child rearing) practices at home are positively associated with weight, height, social and cognitive development of 3-year-olds. Interventions in these areas can overcome disparities in child development outcomes due to household income, educational attainment of the mother and caregivers, ethnicity, rural location, and being left-behind by migrant parents.

The report considers it highly desirable to universalize ECDE for the 0-6 age group in the long run because it equalizes opportunities and enhances the country's future competitiveness. But the report focuses on the medium term and advocates a two-pronged, pro-poor approach in the 12th Five Year Plan (2011-2015). First, the Anti-Poverty Program should include ECDE for the extremely poor, and poverty monitoring should include child development outcomes. Second, ECDE should deserve close attention and become a mainstream service. Expansion of ECDE is financially feasible if: (i) central fiscal transfer supplements county spending in Western and Central Regions in a similar way as it supports compulsory education, and (ii) cost-

effective community-based and home-based interventions in pre-natal care, parenting education, medical check-ups for children, and early stimulation programs. Conditional cash transfer or vouchers could be used to stimulate demand.

Executive Summary

I. The Challenges to ECDE in China

Since the implementation of economic reform, GDP per capita in China has grown more than 10-fold from about \$300 in 1980 to about \$3,300 in 2009, lifting hundreds of millions out of poverty. However, the rural-urban income gap remains wide: the average rural annual income per capita (RMB5,153, or US\$758) is less than one-third that of urban income (RMB17,175 or \$2,526). In 2009, 35.97 million people still lived in absolute poverty, with a per capita annual income of less than RMB1,196 (\$176) (NBS, 2009), lower than the World Bank's poverty line of \$1.25 a day. Children under 12 years of age accounted for 18 percent of this group. There is a growing realization in the policy circle that economic growth alone cannot reduce absolute poverty and inequality, and that investments in human development and improvement in access to service are needed to sustain growth and improve social cohesion. Since China has already universalized nine years of compulsory education and has rapidly expanded enrollment in post-compulsory education, the biggest gap in its human development strategy is in early childhood development and education (ECDE) for children from birth to six years of age. Yet, investments in ECDE are one of the most cost-effective strategies to break the inter-generational transmission of poverty, and to improve productivity and social cohesion in the long run.

Neuroscience and longitudinal studies ECDE found that prenatal care and experiences in the first six years of life affect physical and brain development of children, thereby, the cognitive and socio-emotional development in subsequent stages of their lives. Lack of access to nutrition and health care, insufficient stimulating human interaction, and non-enrollment in pre-primary education are associated with lower educational attainment and achievement, which, in turn, reduce life-time earnings and potentially contribute to disruptive behavior to society.

The contribution of ECDE to subsequent achievement was again evidenced in the recently released results of OECD's Programme for International Student Assessment (PISA) (2010), a cross national comparison of mathematics, science and reading skills of 15-year-olds. In this study, Shanghai-China had the highest scores among 75 participating countries and territories. There was a difference of over 60 score points (or about 10 percent difference in the scores in Shanghai) between 15-year-old students who had attended pre-primary school for more than a year and those who did not. This suggests that China can boost its overall student achievement further by universalizing ECDE services. This is consistent with the conclusion of Nobel Laureate Heckman and his coauthor (2003) that investing in ECDE yields the highest economic returns because early learning (including formation of good habits) is far more productive than later, remedial education. The internal rates of return of rigorously evaluated programs range from 7 percent to 18 percent, which is higher than the rates of return to financial capital on average.

Although China has made enormous progress in maternal and child health and has universalized nine year of compulsory education, the challenge to bridge the gap in ECDE between rural and urban areas remains enormous. In 2008, in rural China, the prevalence of anemia at 6 months was 34 percent and stunting among 3-year-olds was 14.9 percent. In poor rural counties, stunting was as high as 21 percent. The rural and urban gap in height and weight widens as children grow up. According to MOH data from 2005, at age 6, urban boys on average weighed 1.7 kilos more than rural boys, and urban girls were 2.44 kilos heavier than rural girls (MOH, 2009). In height, urban boys were 2.6 centimeters taller than rural boys on average, while urban girls were 2.4 centimeters taller than rural girls (MOH 2009). Rural children were more likely to be deficient in calcium, iron and zinc. About 16 million babies are born every year, and 61 percent of them live in the rural areas. In 2008, under-5 mortality was reduced to 19 per 1,000 live births, far below developing countries' average of 72. Yet, the rural-urban gap remained large as under-5 mortality in rural areas was 23 per 1,000 live births, almost three times higher than 8 in urban areas. China has made great progress in reducing maternal mortality, which declined from 80 per 100,000 persons in 1991 to 34 per 100,000 persons in 2008. Furthermore, the rural-urban gap was narrowed, reflecting a successful direction in reducing disparity in maternal health services.

The variations across provinces are large. Prenatal check up nationwide is 90 percent, with variation from the high of 99 percent in Beijing to the low of 67 percent in Tibet. Children born with a low birth weight of under 2,500 grams range from 0.28 percent in Beijing and 0.08 percent in Shanghai to 4.2 percent in Jiangxi and Yunnan, respectively, and 6.5 percent in Tibet.

An estimated one-third of rural children are left-behind by their parents who have migrated elsewhere to work. They are usually cared for by their grandmothers, who tend to have lower educational attainment and less knowledge than their parents about nutrition, health, and education. Although gross enrollment ratio in kindergarten increased from 21 percent in 1985 to 51 percent in 2009, only about one-third of rural children have access to early childhood education, of whom about one-third were in one-year preschool only, not in 3-year kindergarten. The emotion, social and cognitive development of the left behind children has increasingly displayed signs of stress.

II. Policy and Access to ECDE Services

China has long seen the future of the country lies with its children. The *National Guidelines on Family Education* (2010), jointly issued by All-China Women's Federation (ACWF), Civilization Office of the Central Communist Party Committee, National Population and Family Planning Commission (NPFPC), Ministry of Education (MOE), Ministry of Civil Affairs (MOCA), and Ministry of Health (MOH), and China National Committee for the Wellbeing of the Youth, reflects a heightened emphasis on family education as a foundation for nation building. The State Council's *Outlines of China's National Plan for Medium- and Long-Term Education Reform and Development 2010-2020* (2010) has set the 2015 target of expanding the gross enrollment ratio in 3 years of kindergarten from 51 to 60 percent, that of 2 years of kindergarten from 65 to 70 percent, and that of 1 year of preschool from 75 to 85 percent. The GER target for 2020 is 70 percent, 80 percent and 95 percent, respectively, for pre-primary education of different duration. The *Educational Plan* also highlights the importance of the development of children between 0-3 years of age and the need to pay special attention to

rural children. The new policy focus is farsighted, seeing investments in ECDE as an effective strategy to break the cycle of poverty and to improve the quality of human development.

Various ministries are responsible for promoting ECDE from different directions. The National People's Congress legislates to protect the rights of women and children and regulates services for them. The State Council promulgates policies and directives concerning women and children. The National Working Committee on Women and Children (NWCCW) is the highest body safeguarding women and children's rights and coordinating affairs across government departments and non-governmental organizations (NGOs). While the cooperation among various ministries has been increasing, overall, policy, coordination, administration, finance and service delivery in ECDE remains somewhat diffused. Implementing the well-intended, far-sighted policy is a challenge.

Policy and supervision are the responsibilities of line ministries, while service provision and financing are the responsibilities of county governments in rural areas and district governments in municipalities. The key policymakers and service providers are as follows: (i) MOE is responsible for policy and planning for pre-primary education, sets service standards, provides suggestions for charging of fees, establishes inspectorate and evaluation system for pre-primary education, oversees the education and certification of kindergarten principals and teachers, Education Departments in counties and municipalities operate and finance public kindergartens, as well as approve and supervise private kindergartens. (ii) The National Population and Family Planning Commission (NPFPC) is responsible for raising the quality of the population. It cares about early childhood development, and has established about 50 demonstration centers that provides services for maternal and child medical checkup and early stimulation. (iii) MOH sets policy, organizes services for maternal and child health, monitor indicators, sets standards, regulates and supervises health and hygiene for kindergartens. Health Departments in counties and municipalities provide pre-natal and post-natal care, free vaccination for children, and annual check-up for children. (iv) Ministry of Human Resources and Labor Security (MHRSS) defines occupational standards for caregivers of children aged 0-3 and directors of nurseries and provides certification. (v) MOCA is responsible for family welfare, child protection, and disaster relief, oversees orphanages for orphans and abandoned children. It considers ECDE as an important aspect of community service. (vi) All-China Women's Federation (ACWF) is a key advocate of women and children's rights. It promotes ECDE from the perspectives of family welfare and family education. (viii) Private organizations, for profit and non-profit, run about 60 percent of all kindergartens and nurseries in the country.

The poor and rural children, particularly ethnic minorities, have relatively lower access to ECDE than other children. About 57 percent of enrollment in ECDE in China is in cities and towns, and only 43 percent is in rural areas. Rural children are under-served because county governments' weak fiscal capacity limits supply, and parents' inability to pay dampens demand.

The growth in ECDE coverage in the last three decades was largely driven by growth of these services in the cities. This masked the decline in service provision to the rural areas. The number of rural kindergartens was reduced by half from 130,030 in 1986 to 64,700 in 2006, while the number of city kindergartens grew from 24,500 to 31,800, and those in the towns from 18,700 to 33,900 over the same period. Enrollments follow the same pattern.

Disparities in quality have exacerbated the rural/urban inequality in access. The national pupil-to-teacher ratio is 17:1, but it is 9.5:1 in the cities, 19:1 in county towns, and 34:1 in rural areas. Variations in the pupil-to-teacher ratio in rural areas across provinces are large, ranging from 8:1 in Shanghai to a staggering 167:1 in Ningxia (an arid autonomous region of Hui Muslim) and 164:1 in Guizhou (the poorest province in China which is mountainous and inhabited by minorities).

III. Financing of ECDE

The disparity in access to service is partly the result of inadequate public expenditure. In 2008, ECDE accounted for 9.3 percent of the total enrollment in the education system but public spending on ECDE was a paltry 0.01 percent of GDP, or 1.3 percent of the total public expenditure on education. This is far below the OECD average of 0.5 percent of GDP, or 8 percent of total public spending. Specific countries spend more. For example, Mexico spent about 13 percent of its total public expenditure on this subsector.

ECDE services are financed mostly on a cost-recovery basis, be that public or private nurseries and kindergartens. About 60 percent of kindergartens are private, enrolling about 40 percent of the students. The monthly fees range from RMB130-800 (\$19-\$118) on the low side, to RMB3,000 (\$441) on the high end. The low end covers mostly food, and learning materials. The more expensive kindergartens also provide air-conditioning, and Chinese-English bilingual education. However, sponsorship fees are usually charged over and above the monthly fees which can range from RMB3,000 to 12,000 per year (\$441-\$1,765). Sponsorship fees are used to purchase equipment (HDTV, computers, DVD, musical instruments), and for repair and maintenance, security and decoration of the premises. To put the fee levels in perspective, in 2008, the average rural income was RMB 5,153 (\$758). Thus the inability to pay is the main barrier to access on the demand side, and the lack of local capacity to finance kindergartens constrains supply. Without policy intervention to ensure equity, ECDE could become education for the elite.

IV. Determinants of Child Development Outcomes and Policy Implications

To inform policy about potential areas of intervention, a household survey in Hunan was jointly conducted by the Training and Communication Center of NPFPC and the World Bank in March 2010, to address the following questions:

- How large are the disparities in child development outcomes between rural and urban areas, between boys and girls, between Han and ethnic minorities, and between children cared for by their own parents and the left-behind children?
- Do enrollment in kindergartens, access to health check-up and good child rearing (parenting) practices make a difference in child development outcomes, after controlling for rural and urban resident status, ethnicity, gender, left-behind status, educational attainment of mother and other caregivers, and family income?

Hunan was chosen because its economy is largely based on agriculture, its per capita GDP is at the lower-middle income level, it is a major labor-exporting province, and has

several ethnic minority groups. The survey took a sample of 15 counties/districts in cities, and an additional sample of 2 minority autonomous counties for comparison with the main sample. The survey administered a questionnaire for the primary caregiver, taking information on household characteristics, access to services, and child rearing practices. It also included a direct observation and test of the cognitive skills of 3-year-olds. The survey collected data from 1,011 rural and urban households and their 3-year-old children.

The findings confirmed the inequity from the macro data. About 32 percent of children in 15 counties in the main sample and 48 percent of children in 2 minority counties are left behind by their migrant parents and are cared for by their grandparents or others. Urban children, Han, children cared for by their mother, and those who attend kindergartens are heavier, taller, and have better cognitive scores though not necessarily better social development scores, than rural children, ethnic minorities, left-behind children, and those who do not attend kindergartens. Although girls are shorter and lighter, they tend to have higher social and cognitive scores than boys in the 15 counties. On the whole, minority girls living in the 2 minority counties have the lowest weight and height than all other groups.

A multivariate analysis of the data in 15 counties of the main sample used weight, height, social development and cognitive development, separately, as outcomes measures. The analysis began by regressing demographic characteristics on the aforementioned child development outcomes, and then added four sets of independent, policy variables to see whether they make any differences. These were: (i) attendance in kindergartens and parent-child classes; (ii) access to medical check-up and immunization; (iii) child rearing practices (such as frequency of reading to the child, play with the child, discipline, and watch TV); and (iv) dietary habits. The findings are as follows:

- The factors associated with child outcomes varied across weight, height, social development and cognitive development.
- After adding the policy variables – enrollment in kindergarten, child rearing practices, diet and nutritional intake, health check-up, and caregiver’s access to information -- household income and mother’s education had no additional effect on weight, height and social development. Caregivers’ education had increased effects on height. For cognitive development, the effects of household income, mother’s education, and caregiver’s education were also reduced.
- Weight at birth remains a consistent predictor of weight and height at survey, suggesting the importance of prenatal care and nutrition. Ethnic minorities are taller than Han after holding other variables constant, meaning proper nutrition and health interventions are important.

The findings have policy implications. Because birth weight is a consistent predictor of subsequent physical growth, interventions at the prenatal stage can ensure the healthy development of children. Second, interventions that provide or subsidize nutrition, health care, parenting education, provide information and training to caregivers, and attendance in kindergarten could promote desirable development of weight, height, social and cognitive development of children.

V. The Way Forward

Given the social benefits and high economic returns to society, universalization of nutrition, health and education to all 0-6-year-olds should be the long-term goal, but due to resources constraints, the 12th Five-Year Plan period (2011-2015) should adopt a two-pronged, pro-poor approach. This includes: (i) targeted interventions to the extremely poor through the Government's Anti-Poverty Program; and (ii) expansion of ECDE as a main stream social service, with central fiscal transfer to Western and Central regions.

(1) ECDE as part of the Government's Anti-Poverty Program.

The prime target of intervention should be the estimated 3.3 to 4 million 0-6-year-olds among the 35.59 million extremely poor people, whose average annual income is lower than RMB1,196 (\$176). Geographic targeting is possible because 66 percent of the extremely poor live in the Western Region, 25 percent in the Central Region, 5 percent in the Eastern Region, and 3.2 percent in the Northeastern Region (National Bureau of Statistics, 2009). Ethnic minorities will likely benefit from these interventions. Because ethnic minorities are granted with preferential family planning policy, they also tend to have more children.

This policy note advocates for the Anti-Poverty Program to include ECDE services for these extremely poor children. In 2008, about 45 percent of the Anti-Poverty Funds was spent on improvement of the means of production, 32 percent on infrastructure improvement, but only 1.8 percent on social services, including education and training. However, ECDE is not included in the Program. Future ECDE services should be distinguished for two age-groups:

- **Interventions for the 0-3 age-group** should aim: (i) to improve prenatal care, nutrition and information for extremely poor pregnant women and to subsidize their hospital delivery in order to raise the probability of delivering a healthy baby; (ii) to improve nutritional and health status of young children through provision of nutritional package (with protein, iron, calcium, zinc, Vitamin B2 and Vitamin D3) from 6 to 24 months of age, to overcome the nutritional deficiency after termination of breast feeding; (iii) to improve the knowledge of mother and primary caregivers about health, nutrition, child care and techniques of early stimulations to foster emotional, social and cognitive development through parenting education; (iv) to foster the formation of network of caregivers in local communities to share experience and create opportunities for children to interact with their peers in order to develop language and social skills. International experience shows that home-based and/or community-based approaches that facilitate interaction and training of mothers and caregivers by persons knowledgeable about nutrition, health, and stimulation can be highly cost-effective.
- **Interventions for the 3-6 age group** should focus on formation of good habits and on improving their school readiness skills – which include language, numeracy, and psychosocial skills through the provision of pre-primary education. However, this does not mean to replicate the expensive formal model of center-based ECDE. The formal

kindergarten provides up to about 40-60 hours of services per week or 8-10 hours per day, including lunch and a two-hour afternoon nap. International experience shows that most children could have cognitive gains by having learning activities for 15 to 30 hours a week (i.e., 3 to 6 hours a day) for nine months of the year. Reducing the time of center-based services could reduce cost, as more children can be accommodated in two shifts in the same facilities, and perhaps even the same teachers. Alternatively, parenting education can be used to deliver curriculum-based information for caregivers to implement at home, to be complemented by organization for peer interaction.

Good outcomes indicators for the 0-3 age group include: full immunization against major diseases; completion of all prophylaxis by the end of age 3; appropriate height- and weight-for-age; age-appropriate gross and fine motor skills, auditory and visual skills, toilet trained, ability to communicate clearly and confidently, sociability and ability to stay away from family for a few hours.

Good outcomes indicators for the 3-6 age group are: activeness, curiosity, good fine and gross motor skills, ability to communicate and narrate experience confidently, age-appropriate self-help and social skills, age-appropriate height and weight, freedom from intermittent diseases, and nutritional security. If there is disability, it should be identified as early as possible, between 3 and 6. There should be appropriate management of disability to mitigate the debilitating effects.

The Government monitors poverty closely, but the National Development Plan and Anti-Poverty Program do not monitor non-income poverty indicators. The nutritional indicators are also not monitored in educational plans. It is highly desirable to include nutrition, health, and education outcomes indicators in all of these national level plans and statistics.

(2) ECDE as an expanded mainstream service.

ECDE interventions that are successful in reducing income and social gaps between poor and non-poor populations are multi-sectoral in nature, including health, nutrition, education, water, hygiene, sanitation, and legal protection. To make ECDE a mainstream service, there is a need to set up a policy framework to provide the vision and the targets, so that different policy areas that affect young children can be linked together and coordinated across multiple line ministries and their local counterparts towards a common set of outcomes. In China, the responsibilities for the 0-3 age group are most diffused, and the need for a policy framework is also more acute.

International experience suggests that a national ECDE policy framework would include the following elements: (i) defining an institutional anchor and achieving intersectoral coordination; (ii) ensuring adequate funding (e.g., by creating a dedicated national fund, using existing social funds or budgets, or instituting fee-sharing schemes or earmarked taxes); (iii) defining core priorities, such as whether policies will be targeted or universal, which populations take priority, and what proportion of funds will be allocated to ECDE activities; (iv) building on the success of existing interventions, based on rigorous evaluations and cost accounting; and (v) ensuring coherence with other related policies from inception. Having a policy framework would be important to guide the allocation of funds and activities. There should also be a set of

monitoring indicators to measure progress towards the goal and provide the foundation for an accountability mechanism.

China's demographic trend is highly favorable for investment in ECDE because of the relative small size of the age group, low child dependency ratio and increasing urbanization. The 0-14 age group declined from the height of 41 percent of total population in 1964 to 19 percent in 2008, making it more feasible and affordable to provide high quality care, development and education to children. The trend of increasing urbanization also makes it easier to provide ECDE service than before. The mainstreaming of ECDE as a regular social service could eventually lead to universal coverage for the 0-6 age group.

By improving the quality of human development, ECDE also simultaneously improves the future citizens' productivity and competitiveness, thereby enabling China to overcome the challenges of an aging population and transition into a high income economy.

Chapter 1. The Challenges to ECDE in China

Since the implementation of economic reform, GDP per capita in China has grown more than 10-fold from about \$300 in 1980 to about \$3,300 in 2009, lifting hundreds of million people out of poverty. China's progress in education is equally impressive. At the time of the founding of the People's Republic in 1949, 80 percent of China's population was illiterate and only 20 percent of its children were enrolled in primary education. However, sustained efforts in educational development have fundamentally changed the human resource endowment of the country. Between 1985 and 2008, the net enrollment ratio (NER) in primary education rose from 96 to 99.5 percent. This is no easy task as reaching the remaining hardest to reach children is most costly and challenging. Over the same period, the gross enrolment ratio (GER) in pre-primary education increased from 20 to 51 percent, junior secondary education from 52 to 99 percent, senior secondary education (including vocational and technical education, or TVET) from 29 to 79 percent, and tertiary education from under 3 to 24 percent. China compares favorably with international indicators (see Annex 1). China's investments in education has sustained its economic growth, which, in turn, provides more resources for further expansion and deepening of human capital, forming a virtuous cycle.

In spite of the progress, China faces formidable challenges. First, its population is aging, just as China is trying to make the transition from a middle-income to a high-income economy. People aged 65 and over will more than double from 8 percent in 2009 to over 17 percent by 2030. The burden of increased productivity and competitiveness to sustain economic growth and support the older population will fall on those who are still in early childhood today. Second, the gap between the rural and urban area remains wide: in 2009, the average rural annual income per capita was RMB5,153 (US\$758), which was less than one-third that of urban income of RMB17,175 (\$2,526). About 35.97 million people still lived in absolute poverty, with a per capita annual income of less than RMB 1,196 (\$176), lower than the World Bank's poverty line of US\$1.25 per day. Children under 12 years of age accounted for 18 percent of this group, according to the Government's Poverty Monitoring Report (NBS, 2009; <http://www.docin.com/p-96446208.html>). There is a growing realization in the policy circle that economic growth alone cannot reduce absolute poverty and inequality, and that additional investments in human development and improvement in access to services are needed to sustain future development and build a harmonious society. The subsector that offers the greatest potential to reach China's development objectives is early childhood development and education (ECDE), as other subsectors in education are already moving in the right direction.

Worldwide, poverty and inequality begin from pregnancy and continue after birth: children who were born into poor families have a higher probability of having lower birth weight due to poorer nutrition. Low income parents are more likely to have low levels of education attainment and less knowledge about good child rearing practices. They also have to work instead of spending more time with their children to stimulate their development. They are also less likely to have access to public services, such as water, sanitation, health, and education. A recent study that quantifies inequality in Latin America found that inequality of opportunity

accounts for between 20 to 50 percent of observed economic inequality in Latin America (Ferreira and Gignoux, 2007).

Investments in ECDE are one of the most cost-effective strategies to break the inter-generational transmission of poverty and improve equality of opportunity. Evidence from neuroscience and longitudinal studies of ECDE found that experiences from birth to the first six years, affect the development of the brain, thereby, the cognitive and socio-emotional development of children in subsequent stages of their lives. Inequitable access to ECDE services contributes to inequitable outcomes later in life, in terms of educational attainment, achievement, life-time earnings, and potential disruptive behavior to society. International experience shows that investing in ECDE yields the highest economic returns because early learning is far more productive and cost-effective than later, remedial education. The internal rates of return of rigorously evaluated programs range from 7 percent to 18 percent, which is higher than the rates of return to financial capital on average.

Recognizing the urgency to further reduce poverty and to address rising inequality, the 11th Conference of the National People's Congress (NPC) and Political Consultative Council (NPPCC) of 2010 put unprecedented emphasis on improving the livelihood of the people. The *National Guidelines on Family education* (2010), jointly issued by All-China Women's Federation (ACWF), National Population and Family Planning Commission (NPFPC), Ministry of Education (MOE), Ministry of Civil Affairs (MOCA), and Ministry of Health (MOH), Civilization Office of the Central Communist Party Committee and China National Committee for the Wellbeing of the Youth, reflects a heightened emphasis on family education as a foundation for nation building. The State Council's *Outlines of China's National Plan for Medium- and Long-Term Education Reform and Development 2010-2020* (2010) has set the 2015 targets of expanding the gross enrollment ratio in 3 years of kindergarten from 51 to 60 percent, that of 2 years of kindergarten from 65 to 70 percent, and that of 1 year of preschool from 74 to 85 percent. The GER targets for 2020 are 70 percent, 80 percent and 95 percent, respectively, for pre-primary education of different duration (see Annex 2). The *Educational Plan* also highlights the importance of the development of children between 0-3 years of age and the need to pay special attention to rural children. The new policy focus is farsighted, seeing investments in ECDE as an effective strategy to break the cycle of poverty and to improve the quality of human development, thereby improving social cohesion and future competitiveness.

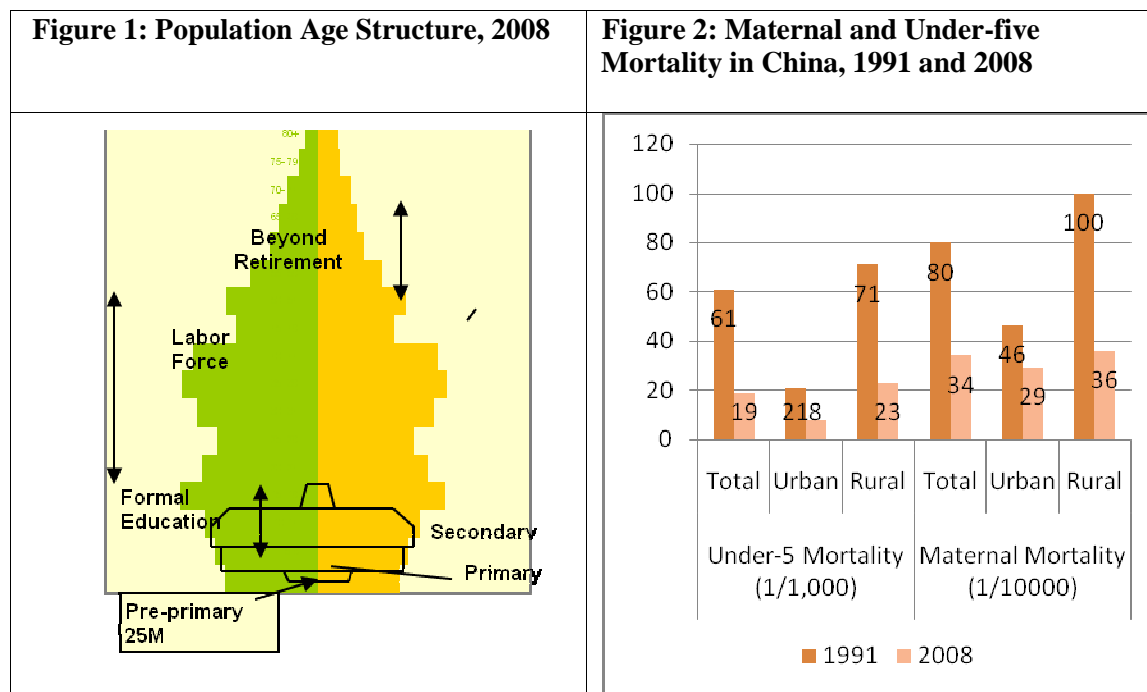
This chapter will examine the indicators of child development status in China in order to acknowledge the accomplishments and to understand the scope of the challenges. It draws on the conceptual framework of child development in Annex 3 for organizing the indicators and discussion. This chapter then reviews evidence of how ECDE can change the trajectory of life chances, improve the quality of the population, and bring high economic returns to society.

1.1. The Status of Chinese Children

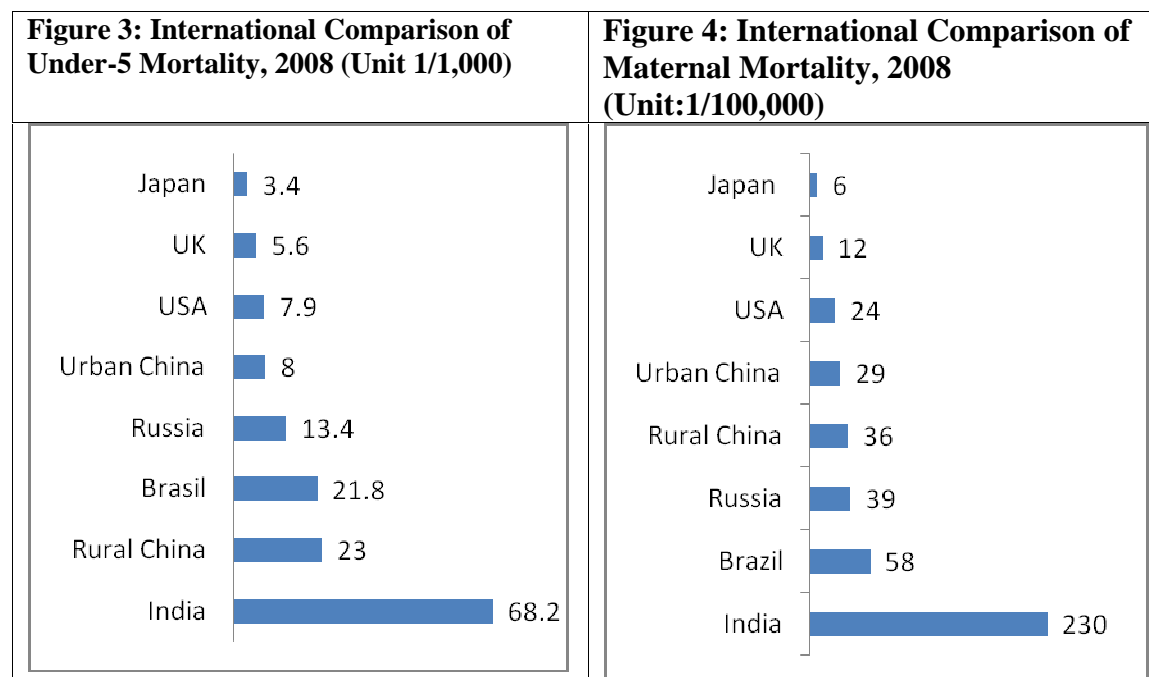
China's 0–6 population has been declining in the last two decades, from 161 million in 1990 to about 100 million in 2008 (Population and Employment Yearbook, 2009). This cohort accounts for approximately 7.5 percent of China's 1.3 billion citizens (Figure 1), lower than the 11 percent in OECD (OECD, 2008). Due to the policy of family planning, both the Government and households are able to allocate more resources to improve maternal and child health.

According to the United Nations' Millennium Development Goals, since 1990, the under-5 mortality¹ in developing countries as a whole declined by about 28 percent, from 100 deaths per 1,000 live births to 72 in 2008 (<http://www.un.org/millenniumgoals>). By comparison, the under-5 mortality in China declined from 61 to 19 per 1,000 live births over the same period (Figure 2), much faster than the developing world's average. However, the urban-rural gap remains. In 2008, the under-5 mortality in urban China was 8 per 1,000, closed to developing countries' level, but that in rural China was 23 per 1,000, almost three times higher than urban China. Under-5 mortality in rural China was higher than the national average of Brazil (21.8 per 1,000) and Russia (13.4 per 1,000) (see Figure 3).

In China, maternal mortality also declined from 80 per 100,000 live births to 34 between 1991 and 2008 (see Figure 2). While China still has some way to go to reach the rate in developed countries in maternal mortality, it fares better than other BRIC countries (Brazil, Russia, India and China) (see Figure 4). The rate of decline in maternal mortality in rural China was faster than that in urban China. The relatively small difference in maternal mortality in urban China (29 per 100,000 live births), and that in rural China (36 per 100,000 live births) indicates that China has found an effective way to address disparity and improve social development (see Figures 2 and 4).



¹ Under 5 mortality estimates the probability of dying (per 1,000 live birth) under five years of age. It is a leading indicator of the level of child health and overall development in countries. It is also a Millennium Development Goal indicator.



Source: World Bank World Development Indicators, 2009. Note: The figures for other countries are national average, without rural/urban breakdown.

The average birth weight of new born babies in China is 3,228 grams (3.2 kilos), reaching the level of developed countries, according to World Health Organization's Growth Standards. The percentage of babies born with a birth weight below 2,500 gram decreased from 3.7 to 2.4 between 1991 and 2008. This is much lower than middle-income countries' average of 15 percent. Severely malnourished children also declined from 3.1 percent in 2000 to 1.9 percent in 2008, again compared favorably with middle income's average of 13 percent. Immunization reached 99 percent of children (MOH, 2009).

China's improvement in nutrition and health is attributable to the success of the national poverty alleviation program since 1993, and policies that resulted in an average annual income increase of farmers by 7 percent. Exemption of agricultural tax, direct subsidies for agriculture, grain cropping risk management fund, free compulsory education and medical insurance have contributed to improved nutrition and health.

The challenge to improve child health and child development remains enormous, however. About 16 million babies are born every year, and 61 percent of them live in the rural areas.² The variations across provinces are large. Prenatal check-up nationwide is 90 percent, with variation from the high of 99 percent in Beijing to the low of 67 percent in Tibet. Children born with a low birth weight of under 2,500 grams range from 0.28 percent in Beijing and 0.08

² Although 55 percent of China's population lives in the rural areas, the percentage of those with agricultural resident status (hukou) is actually 70 percent. As migrant workers from the rural areas make up about 250 million population, The difference between the urbanization rate (45 percent) and the percentage of agricultural hukou is due to rural to urban migration. Migrant workers' children are still counted as rural residents.

Figure 5: Percentage of Children Under-5 with Severe Malnutrition by Province, 2008



5

Figure 6: Underweight by Age, 2008
(Unit: % of children)

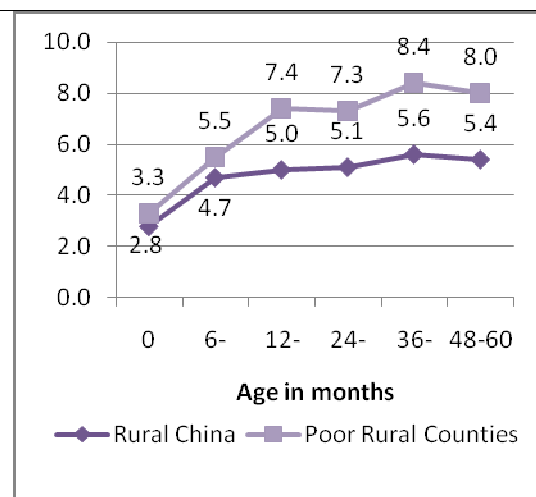
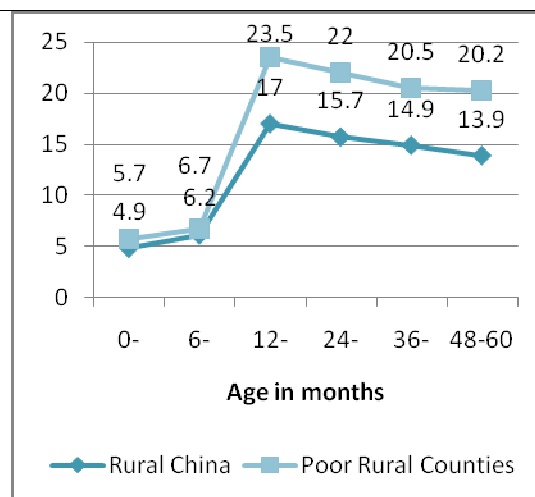


Figure 7: Stunting by Age, 2008
(Unit: % of children)



Source: Chen, presentation on findings from “Report of China Food and Nutrition Surveillance System, 2009” at the International Symposium on Anti-Poverty and Early Childhood Development, Beijing, October 29-30, 2009.

The urban and rural disparity in height and weight increased with age. In 2005, at age 6, urban boys on average weigh 1.7 kilos more than rural boys, and urban girls were 2.44 kilos heavier than rural girls (Table 1). In height, the rural/urban difference was about 2.6 centimeters for boys and 2.4 centimeters for girls.

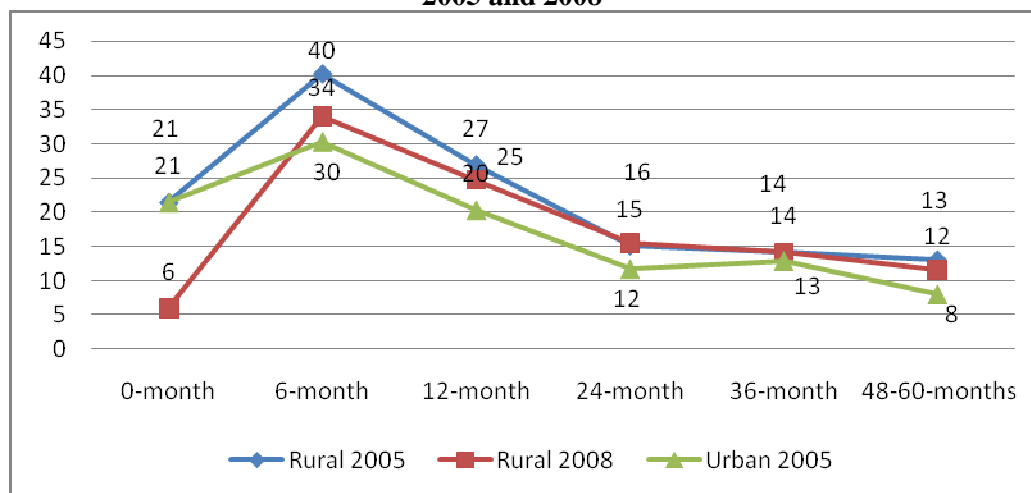
Table 1: Physical Development of Children at Birth, at Age 3, and Age 6, 2005

	Female		Male		Female	
	Weight (kg)	Standard Deviation	Weight (kg)	Standard Deviation	Height (cm)	Standard Deviation
Rural At birth	3.32	0.4	3.19	0.39	50.4	1.7
Urban At birth	3.33	0.39	3.24	0.39	50.4	1.17
Rural Age 3	14.05	1.65	14.22	1.66	97.2	3.9
Urban Age 3	15.13	1.75	14.8	1.69	98.9	3.8
Rural Age 6	20.79	2.89	20.11	2.87	117.4	5
Urban Age 6	22.51	3.21	22.55	2.94	120	4.8

Source: MOH, 2009.

Rural children, particularly those who live in remote areas, are more likely to be deficient in calcium, iron and zinc. This is particularly so after the recommended period of six months of exclusive breast feeding, but supplemental nutrients are not available in their diet. Figure 8 presents the rural and urban differences in anemia prevalence of children under 5. Urban data were available only for 2005. In spite of the improvement, the rural anemia prevalence at 6 months in 2008 was 34 percent, still higher than 30 percent in urban areas in 2005.

Figure 8: Rural and urban disparity in anemia prevalence of children under 5 in China, 2005 and 2008



Source: Chen, presentation on findings from “Report of China Food and Nutrition Surveillance System, 2009” at the International Symposium on Anti-Poverty and Early Childhood Development, Beijing, October 29-30, 2009.

The Food and Nutrition Surveillance Project Team of China’s Center for Disease Prevention and Control (CDC) found that nutritional status of young children is the foundation of intelligence, labor productivity and health and that investing in early childhood nutrition is highly efficient in transforming the health of the population. Fetal under-nutrition and low birth weight make children more susceptible to infection and put them at a higher risk of adult chronic disease such as obesity, hypertension, coronary heart disease and Type II diabetes. Under-nutrition of children aged 0-2 results in physical growth retardation. Iron deficiency could weaken muscle development, reducing labor strength at adulthood. For every 1 percent of low height-for-age, there is a reduction of physical productivity in adulthood by 1.4 percent. The impact of early childhood nutrition on adult height nutritional intervention for children under 3 could result in 8 percent of higher annual wage for one z-score difference of weight-for-age at age 3 (Chen, 2009).

Healthy development of children does not depend on nutrition alone -- stimulation is equally important in facilitating sensory and motor development, language acquisition, and emotional, social and cognitive development. In extreme cases, such as war and famine, children provided with food and nutrition do not grow in weight and height because stress suppressed the pituitary gland from releasing the growth hormone. Children could only develop with human interaction and stimulation.

Some traditional views on child development in China are contrary to the science-based evidence. For example, children under the age of six were traditionally considered to be in a state of "not understanding" and passive. A traditional method of rearing young children, commonly practiced in parts of Shandong and Hubei Provinces even as recently as the 1990s, was known as "sandbag rearing." A new born was laid in a bag of fine sand, which acted as a diaper and was changed once a day. The baby was visited only when being fed by the mother. After a period of

no stimulation, the child becomes quiet, ceasing to express emotions. The baby was generally left in the bag for one to two years. A comparison of a randomly selected “sandbag children” at ages 7 to 16 who were deprived of stimulation for over a year when they were babies, with a similar group raised more normally found that the average IQ of sandbag-reared children was one standard deviation below that of children in the control group, and those left in the sandbag for 24 months scored 1.5 standard deviation below that of children left in the sandbag for 12-18 months (Xie and Young, 1999).

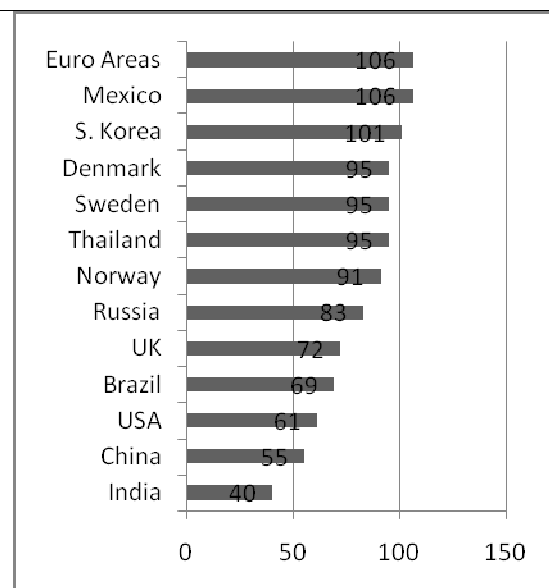
In today’s China, few parents or caregivers, particularly in the urban areas, believe that withholding stimulation is a good way of raising young children. With the rise in educational attainment among parents of young children and reduction of the family size, the risks could be over indulgence. Yet, another trend is undercutting the potential benefits of higher parental education – migration of able-bodied men and women from the countryside to the urban areas for work, leaving behind their children in care of grandparents or relatives. These caregivers generally have lower educational attainment than the parents and are less knowledgeable about nutrition, health and good child rearing practices. An example is that some rural grandparents believe in the advertisement that instant noodle are nutritious and sell their farm-raised eggs to buy instant noodle for their grandchildren. In doing so, they contribute to the under nutrition of their grandchildren unintentionally.

There is no reliable figure on how many children under 6 are “left behind” by their parents in the rural areas. It was estimated that about 221 million rural residents have migrated to the cities in the last three decades and another 100 million are likely to migrate in the coming decade (www.chinapop.gov.cn). Given that it is not easy to migrate and the high cost of living in urban areas, the percentage of left behind children is expected to be high. In a survey in Hunan province commissioned for this study, about 33 percent of 3-year-olds in the main sample were left behind children. In 2005, it was estimated that 55 million children at the compulsory education age were left behind. There is likely to be large variation by locality. In schools located in major labor-exporting counties in Sichuan, for example, 80 percent of children in primary and secondary schools do not have either parents living with them, according to the World Bank review mission of the China Basic Education in Western Areas Project in 2009. The school has been relied upon to assume the role of guardians of these children.

These trends highlight the important role of ECDE services to provide care and guidance in the child’s physical, moral, social and cognitive development in compensating for the lack of parental involvement.

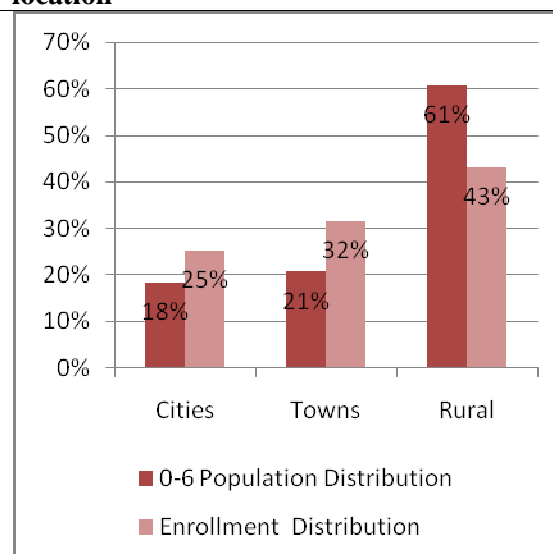
While China’s ECDE coverage has increased from 21 percent in 1985 to 51 percent in 2009, the coverage is low in comparison with some countries that China aspires to become. For example, the GER in ECDE in Mexico is 106 (see Figure 9). Moreover, there is a mismatch between the distribution of the population of 0-6 and enrollment in kindergartens. In 2008, about 61 percent of China’s 0-6 population live in the rural areas, but enrollment in rural kindergartens only account for 43 percent of the total (see Figure10). The under enrollment in rural areas is due to both supply constraints because of county governments’ weak fiscal capacity to provide services, and demand constraints due to parents’ inability to pay for such services. These will be further discussed in Chapters 2 and 3.

Figure 9: International Comparison of Coverage of ECDE (%)



Source: World Development Indicators, 2009

Figure 10: Distribution of 0-6 population and Kindergartens by rural and urban location



Sources: Population and Employment Yearbook 2009; Education Statistical Yearbook, 2009

In summary, the aforementioned indicators suggest that the disparity in child development will be carried over to the rest of the life cycle: poor children are less likely to be healthy and have access to ECDE services. Insufficient investments in their development and education are likely to affect their life time earnings and, thereby, reduce their potential contribution to society. Ultimately, it undermines the country's social cohesion and competitiveness. The following section will examine evidence of the effects of early interventions on human development in order to assess the potential opportunity cost of neglecting ECDE.

1.2. Evidence on the Importance of ECDE

1.2.1. Neuroscience and longitudinal findings

Evidence from neuroscience and longitudinal studies of ECDE suggest that the disparity in child development outcomes may have serious implications. This research has found that experiences in the early years of childhood, from birth and even before, affect the development of the brain, and thereby the cognitive and socio-emotional development of children in subsequent stages of their lives. About 85 percent of a child's brain network is wired in the first 5 years of life. While genes determine when brain circuits are formed, experience shapes the unfolding of the connections among neurons (Mustard 2000, 2007; Center on the Developing Child at Harvard University 2007; Shonkoff and Phillips 2000).

Brain development is continuous, with each developmental step influencing the next (Ellis, Jackson, and Boyce 2006). The brain's architecture and a child's developing abilities build from the bottom up in hierarchical sequence—simple circuits and skills build first, setting the foundation for the building of more-advanced circuits and skills. The sequence of brain

development relating to experience (i.e., the stimulation of sensing pathways—seeing, hearing, touching, smelling, tasting) is, likewise, hierarchical and occurs in stages. The sensing pathways, in particular, develop during critical or sensitive windows of opportunity (mostly at ages 0–3) and link with other biological pathways to affect learning, behavior, and health (both physical and mental) (see Figure 11).

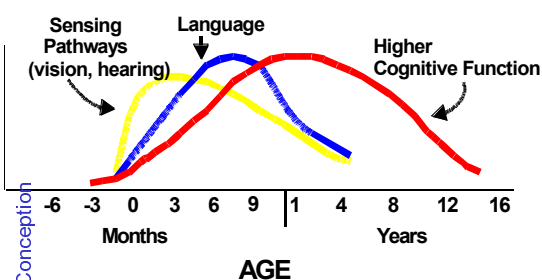
Negative experiences (e.g., poverty, malnutrition, abuse, neglect) affect the brain’s neural circuitry and the developing hormonal and immune systems, just as positive experiences do. The lasting effects extend to a person’s social and emotional skills. Emotional control and habitual response patterns peak in the first few years of life and reach a high level of stability before age 5. That is why early stimulation and learning opportunities prior to primary school entry are so essential.

Language development and language skills, which are a precursor of critical thinking skills, emerge from a series of neurobiological transformations occurring in the early years of life. Language does not suddenly appear at some predetermined age in some predetermined fashion, but rather, emerges after a child has begun to engage with his or her caregivers in interactive activities, such as sharing, requesting, imitating, playing, naming, and describing. A study by Hart and Risley (1995) demonstrates that word accumulation, or vocabulary, begins very early in life and that differences are apparent at 36 months of age among children from different social groups (with the differences correlating directly with differences in the amount of language between parent and child) (see Figure 12). The differences in verbal skills continue—along trajectories—and are still present at age 9, when children are in the formal school system.

Research on the brain indicates that school readiness is shaped by a child’s early environment (Shonkoff and Phillips, 2000; Smith, Fairchild, and Groginsky, 1997). Children’s academic performance in later years also correlates with their exposure to early interventions. In their 1992 analysis of eighth graders’ performance on the mathematics test of the National Assessment of Educational Progress (NAEP), Fuchs and Reklis (1994) reported that characteristics of children (e.g., readiness to learn in kindergarten) and of their households (e.g., mother’s education) had much larger effects on their NAEP test scores than did classroom variables (e.g., staffing ratio).

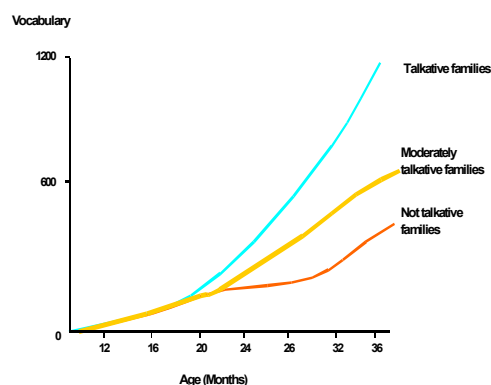
In combination, a child’s environment and early learning experiences determine lifelong trajectories and abilities for learning, behavior, health, and ultimately productivity. Experience-based brain development lays the foundation for the full range of human competencies essential for true human capital formation.

Figure 11: Sensitive Periods of Brain Development



Source : C. Nelson, in *From Neurons to Neighborhoods* , 2000

Figure 12: Effect of Differences in Amount of Language from Parent to Child on Vocabulary Growth

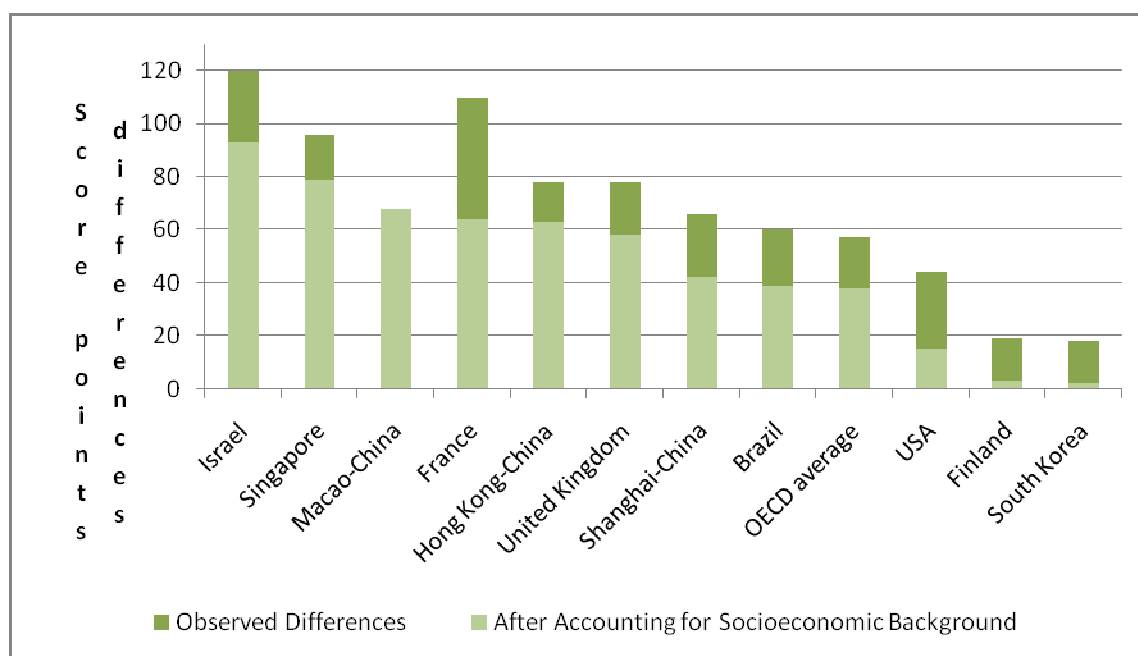


Source : B. Hart & T. Riley, *Meaningful Differences in Everyday Experiences of Young American Children* , 1995

The recent results of OECD's Program for International Student Assessment (PISA) (OECD, 2010a), a cross national comparison of mathematics, science and reading skills of 15-year-olds, provides fresh evidence to reaffirm the contribution of ECDE to school readiness and subsequent achievement. It is the first time China participated in international assessment, although only Shanghai, municipality with 20 million population, took part and the sample is not nationally representative. Shanghai had the highest scores among 75 participating countries and territories. Yet, there was a difference of over 60 score point (or about 10 percent difference in Shanghai's score) between 15-year-old students who had attended pre-primary school for more than a year and those who did not (see Figure 13). In Israel, there was a 120 score point difference between pre-school attendees and those who were not. The performance remains strong even after accounting for socioeconomic factors (see Figure 13).

Cognitive skills have positive impact on economic development because they enhance the capacity to use, adopt and generate technology, and to innovate to solve problems. Research has found that differences in cognitive skills account for a majority of the differences in economic growth rates across OECD countries (Hanushek and Woessmann, 2008; 2009; OECD, 2010b). Hanushek and Kimko (2000) estimate that one country-level standard deviation higher in test performance would yield around one percentage point higher annual economic growth rates during the period 1960 to 1990. Given the impact of ECDE on subsequent academic achievement, investing in ECDE can help boost China's student achievement, which, in turn, enhances the capacity to innovate and sustain competitiveness.

Figure 13: PISA Score Point Differences Between Students who Attended Pre-primary Education for at least a Year or More and Those who Did Not



1.2.2. Economic Returns to ECDE

Inequitable access to ECDE services has contributed to inequitable outcomes, in terms of health, educational attainment, achievement, life-time earnings, and potential disruptive behavior to society. Carneiro and Heckman (2003) conclude that investing in ECDE yields the highest economic returns because early learning is far more productive and cost-effective than later, remedial education, as the social and behavioral skills that children learn in their early years set a pattern for acquiring positive life skills later in life (see Figure 14 and Box 1).

Figure 14: Rates of Return to Human Development – investments across all ages

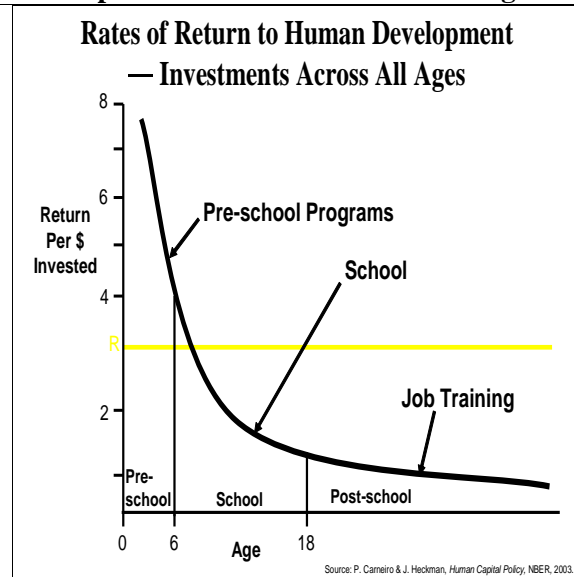
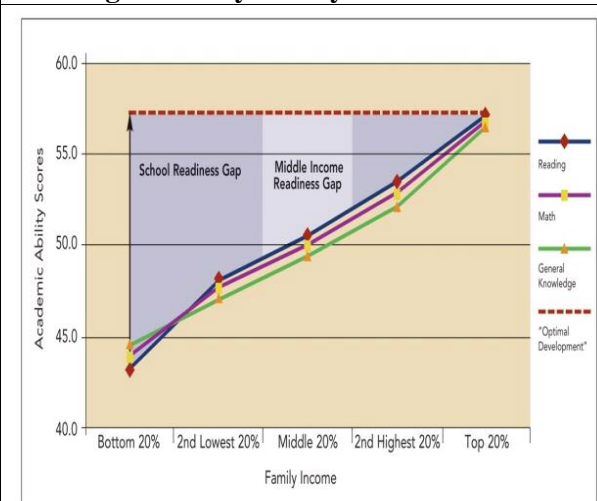


Figure 15: Academic Abilities of Kindergartners by Family Income



Source: Schulman and Barnett 2005.

Box 1: Measuring the Economic Impact of Early Childhood Development

James Heckman, a Nobel Laureate in Economic Sciences from the University of Chicago, has advocated forcefully for greater Congressional funding for early childhood development programs using economic analyses. This work originally came out of his study of the retraining of steelworkers. When the steel industry in Northwest Indiana began to decline, Heckman examined the economic impact of programs that would provide job retraining for the steelworkers who would soon be forced to find employment elsewhere. His conclusions pointed to the difficulty and problems associated in teaching older workers new job skills and the high economic cost of spending money to retrain workers who would soon retire. Heckman writes, “The returns to human capital investments are greatest for the young for two reasons: a) skill begets skills, and b) younger persons have a longer horizon over which to recoup the fruits of their investments.”

In subsequent work, he and other researchers (namely Grolnick and Runewald and Schulman and Barnett) used longitudinal cost/benefit analyses to argue that the economic gains for early childhood education are not directed only at the children, but lead to significant gains for the overall

economy. These researchers often cite the case of Perry Preschool in Michigan for low-income African-American families: for every dollar invested in the Perry School program during the early 1960s, over \$8 in benefits were returned to the program participants and society as a whole.

While participants in these programs directly benefited from their increase in after-tax earnings and fringe benefits, benefits also accrued to the general public. Based on present value estimates, about 80 percent of the benefits of ECD programs went to the general public (students were less disruptive in class and went on to commit fewer crimes), yielding over a 12 percent internal rate of return for society in general. Compared with other public investments, and even those in the private sector, early childhood education appears to be extremely cost-effective.

Sources: Heckman and Carneiro, "Human Capital Policy," working paper, University of Chicago, August 2002; Heckman, Invest in the Very Young. Chicago, IL: Ounce of Prevention Fund, 2000; Rolnick and Grunewald, "Early Childhood Development: Economic Development with a High Public Return," December 2003.

To analyze the economic impact of early childhood programs, these researchers used cost-benefit analyses to convert the benefits and costs of these programs into monetary values in constant dollars discounted annually between 3 and 5 percent. The researchers also measured the internal rate of return of these programs by estimating the time periods in which the costs and benefits in constant dollars were paid or received by program participants and society. The real internal rate of return of several carefully evaluated programs range from 7 to 18 percent, which is higher than the average returns to financial capital which were below 7 percent (see Table 2).

Table 2: Benefit-Cost Ratio of Three American Preschool Programs

	Total benefit per child	Total Cost per child	Net Benefit per child	Benefit/ cost ratios	Internal rate of return
Michigan Perry Preschool participants follow-up at age 40 (in 2000 dollars)	\$244,811	\$15,166	\$99,682	16.14	18%
Chicago CPC (1998 dollars)	\$47,759	\$6,692	\$41,067	7.14	10%
Carolina Abecedarian (2002 \$)	\$135,546	\$35,864	\$99,682	3.78	7%

Source: World Bank, 2010. Note: The benefits and cost were discounted at 3 percent.

Table 3 presents the evaluation findings of the long-term impact of some ECDE programs in USA, Bangladesh, Turkey, Argentina and Colombia. Consistently, ECDE interventions led to highly desirable outcomes: children who have participated in these programs exhibit greater motivation to learn, higher achievement, and higher self-esteem compared with children who did not participate in the programs. Furthermore, early interventions can improve a child's prospects for successful employment later in life by fostering critical learning skills early

in life. Children's early development will determine, by the time they enter school, whether they will succeed in school and later in life. The extent of their learning in school and throughout life depends largely on the social and emotional competence they develop in their early years. A child who is ready for school has a combination of positive characteristics: he or she is socially engaged and emotionally stable, confident, friendly and attentive; has good peer relationships; tackles challenging tasks and persists with them; has good language and communication skills; and listens to instructions.

Table 3: Evaluation Findings of the Impact of ECDE Programs in Developed and Developing Countries

Program Content	Impact
<p><i>Perry Preschool in Michigan, USA:</i></p> <p>In the 1960s, 3-4-year-olds in high poverty areas were provided a daily instruction of 2.5 hours on weekday mornings and a 1.5 hour of home visit once a week in the afternoon for a year.</p> <p>Teachers were certified to teach in elementary, early childhood and special education, and were paid 10 percent above the local public school district's standard pay scale. During the annual 30-week program, about one teacher was on staff for every six children.</p>	<p>At age 27, 117 of the original 123 program participants were located and interviewed. During their elementary and secondary schooling, program participants were less likely to be placed in a special education program and had a significantly higher average achievement score than nonparticipants. Over 65 percent of them graduated from high school compared with 45 percent of nonparticipants. Four times as many participants as nonparticipants earned \$2,000 or more per month. The number of arrest of participants was one-fifth that of nonparticipants.</p> <p>At age 41, participants were 25 percent less likely to be on welfare than control group.</p>
<p><i>Syracuse Preschool Program, USA:</i></p> <p>Prenatal care and ECDE services through age 5 for disadvantaged children</p>	<p>Ten years later problems with probation and criminal offenses were 70 percent less among participants compared with a control group.</p>
<p><i>Chicago Child-Parent Center, USA:</i></p> <p>3-5-year-olds (in high poverty areas) attended 3 hours of pre-school per day for a year and received reading and mathematics instruction from well qualified teachers in small classes.</p>	<p>At ages 20/21, program participants had 22 percent increase in high school graduation and 32 percent reduction in juvenile arrests compared with the control group.</p>
<p><i>Carolina Abecedarian, USA:</i></p> <p>Infants from 6 weeks old to age 5, received early care and pre-school services, with special curricula focused on language development in small classes.</p>	<p>At ages 20/21, program participants are 2.7 times more likely to have attended a four-year college compared with the control group.</p>
<p><i>Bangladeshi center-based preschool education</i></p>	<p>Participants outperformed their peers in the control group by 58 percent on a standardized test of school readiness.</p>
<p><i>Colombia community-based comprehensive ECD interventions</i></p>	<p>Participants were 100 percent more likely to be enrolled in third grade than he control group.</p>

<i>Argentina preschool program</i>	Participants increased the average third grade test grade in mathematics and Spanish by eight percent, compared with the control group.
<i>Turkey mother-child education program</i>	86 percent of participants remained in school during adolescence compared with only 67 percent of those in the control group.

Sources: World Bank, 2010.

In summary, ECD programs contribute both broad and specific effects to human capital development. While poor children tend to be more vulnerable, there is no definitive cut-off point between children who are below a certain poverty line and those who are above that poverty line. Rather, there is a gradient of risks and these gradients last a life time (Figure 15). Neglecting ECDE will exact high opportunity cost to the individual child and to society. For China to build a harmonious society, the first priority is to eliminate absolute poverty and to reduce inequality. The ultimate goal is to ensure that all children can grow up to live to their full potential. This will both improve the quality of human development and enhance competitiveness.

Chapter 2: Policy and Access to ECDE Service

China's policymakers have long recognized that young children are the country's future. From 1949 to 1965, the Chinese government introduced ECDE services in order to free up women to participate in the new society's labor force. Almost all government departments, enterprises, and agricultural collectives operated nurseries and kindergartens for their staff. Although kindergartens were shut down during the Cultural Revolution (1966–1976), the introduction of economic reform in 1978 ushered in the expansion of ECDE services, as well as introduction of various western, child-centered educational theories³. A series of administrative directives and laws were passed to ensure young children's survival, protection, development, and education. This chapter examines the legal framework, the policy and administrative structure, and access to ECDE services.

2.1. The Legal Framework

China's early childhood programs are guided by laws approved by the People's Congress and by regulations set forth by the State Council. ECDE intersects between nutrition, health, education and family welfare. Box 2 lists the major laws and regulations relevant to the operation of ECDE programs.

In particular, the *Law on Protection of Minors*, promulgated in 1991 and amended in 2006, streamlined the responsibilities of local governments at various levels to integrate the protection of minors into the national economic and social development plans and annual plans; to increase fiscal support; to operate kindergartens and nurseries, and to promote home-based services by state and social organizations, enterprises, and individuals. In 1989 and 1996, the State Council approved the following two documents governing kindergartens:

- *The Regulations on Kindergartens* is the legal basis for operating pre-primary services. These regulations set specific norms and standards for preschool education, including language, basic activities, health and hygiene, and safety.
- *The Regulations on the Management of Kindergartens* sets forth the principles of operation of kindergartens. These regulations set comprehensive norms and standards for utilization of space, class size, hygiene and health, safety, qualification requirements of kindergarten personnel, and the relationships among the family, community, and kindergarten.

³ Dewey, Montessori, Bronfenbrenner, Bruner, Piaget, Vyotsky.

Box 2: Major Laws and Regulations Related to Protection and Development of Children

- *Health Regime in Nurseries and Kindergartens (December, 1985)*
- *Regulations on Kindergartens (August, 1989)*
- *Law on Protection of Minors (promulgated in September, 1991 and amended in December, 2006)*
- *Law on Maternal and Infant Care (October, 1994)*
- *Regulations on the Management of Health and Hygiene in Nurseries and Kindergartens (December, 1994)*
- *Education Law (March, 1995)*
- *Regulations on the Qualifications and Responsibilities of Kindergarten Directors (January, 1996)*
- *Guidelines for Kindergarten Education (August, 2001)*
- *Guidelines Governing the Reform and Development of the Early Childhood Education (January, 2003)*
- *National Guidelines on the Safety and Standards of Children's Toys (2003)*
- *Regulations on the Safety Management in Primary and Secondary Schools and Kindergartens (June, 2006)*
- *The National Guidelines on Family Education (February, 2010)*
- *Outlines of China's National Plan for Medium- and Long-Term Reform and Development of Education (2010-2020) (August, 2010)*

Source: UNICEF 2007; Dai, 2009; MOE, 2010; NPFPC, 2010.

In the 21st Century, the State Council issued major documents to guide implementation of policy on ECDE, namely, the *Guidelines for Kindergarten Education* (August, 2001) and, most recently, the *Guidelines Governing the Reform and Development of the Early Childhood Education* (January, 2003) (hereinafter termed the *Guidelines*); and *Outlines of China's National Plan for Medium- and Long-Term Reform and Development of Education (2010-2020)* (August, 2010). The *Guidelines* establishes framework for provision of formal and non-formal ECDE services, led by the government, with participation of non-government sectors. A network of community-based, ECDE service centers is to be developed around demonstration kindergartens, and to cater for the diverse needs of rural and urban areas. The *Guidelines* defines the respective responsibilities of various levels of government, an accountability system, and the basic standards for investment, teachers, and overall quality of kindergartens. The *Guidelines* recommends flexible methods for overcoming regional and urban-rural disparities and an integrated approach that blends parental and formal services (Corter et al., 2006).

In February, 2010, All-China Women's Federation (ACWF), National Population and Family Planning Commission (NPFPC), Ministry of Education (MOE), Ministry of Civil Affairs

(MOCA), and Ministry of Health (MOH), Civilization Office of the Central Communist Party Committee and China National Committee for the Wellbeing of the Youth, jointly issued the *National Guidelines on Family Education*, reflecting a heightened emphasis on family education as a foundation for nation building. The State Council's *Outline of China's National Plan for Medium- and Long-Term Education Reform and Development (2010-2020)* (2010) has set the 2015 target of expanding the gross enrollment ratio in 3 years of kindergarten from 51 to 60 percent, that of 2 years of kindergarten from 65 to 70 percent, and that of 1 year of preschool from 75 to 85 percent. The GER target for 2020 is 70 percent, 80 percent and 95 percent, respectively, for pre-primary education of different duration. The *Outlines* also highlights the importance of the development of children between 0-3 years of age and the need to pay special attention to rural children. The new policy focus is farsighted, seeing investments in ECDE as an effective strategy to break the cycle of poverty and to improve the quality of human development.

Given the diverse entities supporting and operating early childhood programs (e.g., public and private organizations, multiple government sectors, national and local departments), China faces major challenges in enforcing early childhood policies and standards.

2.2. Policy and Administration of ECDE

Policy, coordination, administration, finance and service delivery in ECDE is diffused. The National Working Committee for Children and Women (NWCCW) under the State Council is the highest body coordinating responsibilities across ministries. It leads the development, monitoring and implementation of the National Plan of Actions for Children and National Plan of Actions for Women, and is increasingly engaged in the child development and child welfare.

Policy and supervision are the responsibilities of line ministries, while service provision and financing are primarily the responsibilities of county governments in rural areas and district governments in municipalities. Provincial and Municipality governments exercise oversight of service delivery and often operate and finance training institutions. The key service providers are as follows (see Table 4):

- The Ministry of Education (MOE) sets policy for and oversees implementation of pre-primary education, sets standards, provides opinion on the level of fees charged by kindergartens, monitors and evaluates pre-primary education, establishes an inspectorate system, provides pre-service education of kindergarten principals and teachers, and certifies them. Education departments in local governments operate public kindergartens, and also approve and oversee private kindergartens.
- The National Population and Family Planning Commission (NPFPC) is responsible for raising the quality of the population. It cares about early childhood development, and has established about 50 demonstration centers that provides services for maternal and child medical checkup and early stimulation (see Box 3).
- The Ministry of Health (MOH) sets policy, organizes maternal and child health services and monitor outcomes. It promulgates regulations on health and hygiene in kindergartens, guides and monitors related work. The services provided by the health departments in

local governments include pre-natal and post-natal care, free vaccination, and free annual check up on children (but laboratory tests are fee-charging). The services received by the 0-3 age group are mainly provided by the health sector.

- The Ministry of Human Resources and Labor Security (MHRSS) defines occupational standards for workers caring for children aged 0-3, administers tests and certifies them.
- The Ministry of Civil Affairs (MOCA) considers ECDE as an integral part of community services. It has overall responsibilities for family welfare, child protection, and disaster relief. Local governments finance and operate orphanages for abandoned children and orphans.
- All-China Women's Federation (ACWF) is the leading advocate of the rights of women and children. Through promotion of family education and family development, it promotes the protection of these rights.
- The private sector, including non-profit and for-profit organizations, operate about 60 percent of kindergartens and nurseries in the country.

Service provision to young children crosses several sectors, and, as such, this has truncated the provision of seamless service to the child and the parents. There is insufficient regular coordination across these various stake-holders in ECDE service standards, planning and provision at the national and local levels.

Table 4: Policy, Administration, Finance, and Service Provision of ECDE in China

	Ministry of Health (MOH)	Ministry of Education (MOE)	Ministry of Human Resources and Social Security (MHRSS)	Ministry of Civil Affairs (MOCA)	National Population and Family Planning Commission (NPFPC)	All-China Federation of Women (ACFW)	NGOs and for-profit organizations
Policy, guidelines and services	Sets health and hygiene standards in kindergartens; monitors maternal and child health; provides pre-natal care, immunization for the 0-6 age group, health check-up and curative care.	Sets policy and plans for pre-primary education, (mostly for 3-6 age group); defines responsibilities at various government levels; provides guidelines for kindergarten education; provides education and certification of kindergarten principals and teachers.	Sets occupational standards for caregivers of 0-3-year-olds; provides education and certification of them.	Promotes ECDE as part of community services; cares for orphans from 0 to 15; promotes child protection	Is responsible for improving the quality of the population; promotes early childhood development; provides demonstration centers to promote early stimulation	Advocates for the rights of women and children; supports family education; and promotes community-based ECDE services	Mostly serves the needs of children in the 2-6 age group
Training of providers	Pre-service education of physicians in medical universities, train other health workers in vocational schools	Pre-service education of ECDE teachers in specialized secondary schools, tertiary education institutions and universities	Pre-service education of caregivers of 0-3 age group in vocational schools	Education of social workers	Population education in specialized schools; in-service training of specialized cadres of family planning	In-service training	In-service training

	Ministry of Health (MOH)	Ministry of Education (MOE)	Ministry of Human Resources and Social Security (MHRSS)	Ministry of Civil Affairs (MOCA)	National Population and Family Planning Commission (NPFPC)	All-China Federation of Women (ACFW)	NGOs and for-profit organizations
Finance	County and district governments allocate own budget, hospitals collect fees and generate other extra-budgetary resources	County and district governments allocate budget; schools collect fees and generate other extra-budgetary resources	County and district governments allocate budget, schools collect fees and generate other extra-budgetary resources	County and district governments allocate budget, orphanages collect fees from adoptive parents and generate extra-budgetary resources	County and district governments allocate budget; centers collect fees and generate other extra-budgetary resources	County and district governments allocate own budget, centers collect fees and generate other extra-budgetary resources	Fees
Point of Service delivery	County & district hospitals, township clinics, village health outposts	Pre-primary classes attached to primary schools in villages and towns; kindergartens in cities & towns	Vocational Schools	Child welfare institutes (orphanages)	Early stimulation centers in county towns; Demonstration centers.	Own centers in county towns	Cities and towns

Sources: Constructed by the authors, based on interviews with various ministries.

2.3. Health and Education Service Delivery Structure

Services for the 0-6 age group intersect between pre- and post-natal care, nutrition and health, education and family welfare.

2.3.1. Health

Health administrative departments at all levels of child health care authorities are responsible for children's health care policies, development planning, technical specifications and standards and their implementation. Maternal and child health agencies are within the jurisdiction of professional public health agencies and maternal and child health technical guidance centers.

Under maternal and child health agency's technical guidance, township hospitals, community health service centers, village health clinic and community health service stations and other medical and health institutions are responsible for providing child health services to the local community.

Following the Chinese National Children's Health Standard set by the MOH, newborns prior to discharge receive vaccination and health assessment from the delivery hospital. Maternal and child health professionals, in principle, would conduct regular health check-ups for children 0-6 years old, including two times of home visits for newborns; four times of check-up for children less than one year old; 2 times of check-up per year for toddlers (one- and two-year-olds) and once a year for 3-6-year-olds. This schedule is known as 2:4:2:1. Children have to be taken to clinics to get this service. According to different age characteristics of children's physical and psychological development, there should be qualified child health care professionals to provide basic health services along with immunization schedules during the health check-up, including growth monitoring, feeding and nutrition guidance, integrated early childhood development, psychological behavioral development assessment and oral hygiene guidance, common disease prevention, health and safety protection, health education and health promotion. Table 5 provides the schedule of vaccination for children from 0-6.

Health check up is usually a fee based service, especially for children of 3-6 years old, except for immunization which is free of charge. In recent years, in order to promote good health of children, some cities and provinces have started providing free health check-up for children of 0-6 years old covering some basic items such as growth monitoring, hearing, dental health and hemoglobin levels tests, and so forth. From Grade 1 through Grade 9, there is annual medical check-up in school at a nominal cost for a few RMB yuan per year, but this does not include laboratory tests.

Table 5: Schedule of Vaccination for Children from 0-6

Type	Age	Vaccine	Prevention of diseases
Basic	At birth	Bacillus Calmette-Guérin (or, BCG), Hepatitis B	Tuberculosis (TB), Hepatitis B
	1 month	Hepatitis B	Hepatitis B
	2 months	Oral Poliovirus Vaccine (OPV)	Polio
Basic	3 months	Encephalitis	Encephalitis (brain inflammation)
	4 months	Diphtheria, pertussis (whooping cough) and tetanus (DPT)	DPT
	5 months	DPT	DPT
	6 months	Hepatitis B	Hep B
	8 months	Measles virus (MV)	Measles
Booster	Age 1.5	Encephalitis	Encephalitis
	Age 4	Encephalitis	Encephalitis
	Age 7	Measles DPT	Measles DPT

Source: Dai, 2009; updated by Liu in 2010 and translated by Young, 2010.

2.3.2. Development and Education

Three main types of programs for children under age 6 cover the broad age groups of 0–3 and 3–6: nurseries, kindergartens, and pre-primary classes (also known as pre-school classes, or “xue qian ban”). Table 6 summarizes the type of health and education services offered to children from 0-6 years of age.

- **Services for children ages 0–3** comprise: (i) formal nurseries and extension of kindergarten downward to cover 2-year-olds; (ii) non-formal, home-based tutoring and weekend parent–child centers; and (iii) parent-child classes aimed to provide early stimulation through group play, song, dance and exercises led by instructors (see Box 3 in Chapter 3). Nurseries focus predominantly on care, and care providers are not supervised by education authorities. The vast majority of children under 2 years of age are cared for at home. Parent-child classes are gaining popularity as more parents become aware of the importance of early stimulation. Some kindergartens also offer classes for 2-year-olds.
- **Services for children ages 3–6** comprise kindergartens for three ages: junior (3-year-olds), middle (4-year-olds), and senior (5-year-olds). In contrast to nurseries, kindergartens focus primarily on education. To meet the needs of families’ work schedules, children can stay in boarding kindergartens 5 days a week and go home on weekends and holidays. Approximately 10 percent of China’s kindergartners are in these facilities (Zhu and Wang, 2005).

- **Pre-primary classes** refer to one year of education before the beginning of compulsory education. It is often the precursor of primary education, introducing reading and writing to children. ECDE services in rural areas tend to be the one-year pre-primary class provided in the same compound as primary schools.

Table 6: Type and Coverage of ECDE Services for Children from Birth to Six

Age group	Focus of services	Type of services (all of which are fee-charging)	% of children receiving services
0-3 ~48 million	Care and stimulation	Pre- and post-natal care; fee-charging for delivery; free vaccination; fee-charging for medical check-ups.	99 % immunized.
		Cared for at home.	90% cared for at home.
		Non-formal, home-based.	~5% in non-formal centers.
		Nurseries and extension of kindergarten to age 2, and parent-child class (fee paying).	~5% in formal institutions.
3-6 51 million	Development and education	<ul style="list-style-type: none"> • Kindergartens (3 years leading to primary school), • Pre-primary education (1 year) 	GER 3 years before primary: 51%; GER 2 years before primary: 65%; GER 1 year before primary: 74%.

Sources: Constructed by the authors; State Council's *Outlines of the National Plan for Medium and Long Term Education Reform and Development (2010-2020)*, 2010.

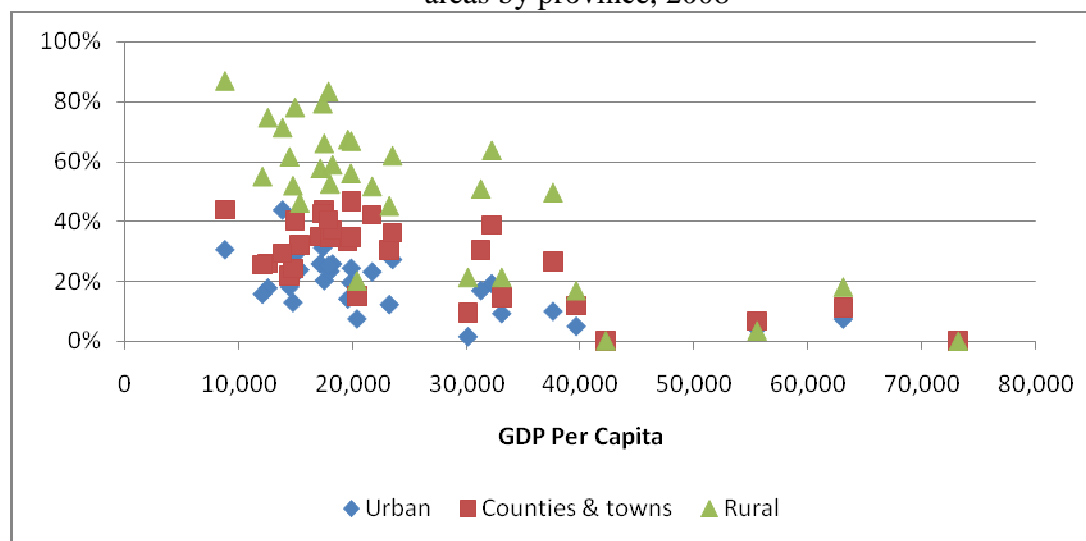
2.4. Access to Early Education Services

About 48 percent of enrollment in ECDE in rural areas is in one-year pre-primary classes, not in 3-year kindergartens. By contrast, pre-primary classes only account for 13 percent of ECDE enrollment in urban areas and 25 percent in county towns. In other words, urban children have a much earlier start in ECDE, entering either at the age of 2 or 3 and staying on until the time for entry to primary school. Rural children, if they have any access to ECDE service, are more likely to be starting at age 5 or 6 for one year duration before entering primary school. Figure 16 shows that pre-school enrollment as a percentage of total kindergarten enrollment is highest in poorer provinces.

The expansion of ECDE coverage in the last two decades was largely driven by growth of these services in the cities which masked the decline in service provision to the rural areas. The number of rural kindergartens was reduced by half from 130,030 in 1986 to 64,700 in 2006, while the number of city kindergartens grew from 24,500 to 31,800 and those in the towns from

18,700 to 33,900 over the same period (see Figure 17). Enrollment follows the same pattern (see Figure 18).

Figure 16: Pre-school as a percentage of Total Kindergartens in Urban, County towns, and Rural areas by province, 2008

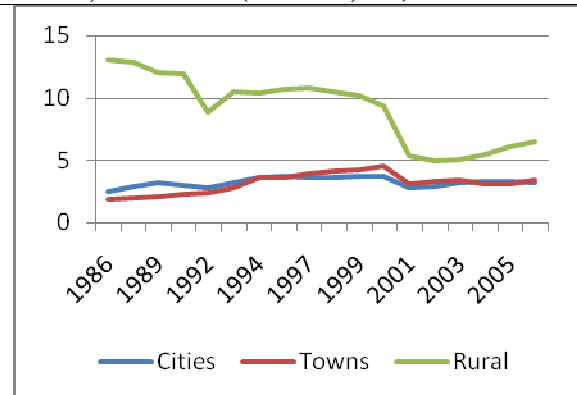


Source: MOE, 2009.

The number of rural teachers also followed the trends of the decline in enrollment in rural areas, falling dramatically in number around 2000 and 2001, while those in cities and towns increased sharply (see Figure 19). This has led to a change in the ratio of pupils to teacher which became as high as 60:1 in rural areas in the early 2000s, although gradually trending down to 37:1. By contrast, the pupil-to-teacher ratio in the cities declined to 9.6:1 by 2006, whereas that in town remained at 17:1 (see Figure 20).

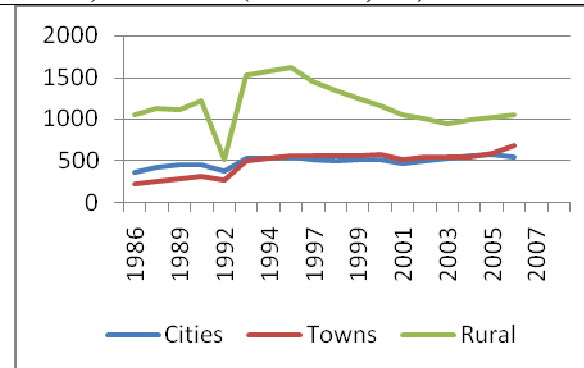
The drop in the rural service in 1992 reflected the steep decline of government revenue that began with the economic reform in 1978 (see Figure 21). Dismantling the planning apparatus led to an erosion of the Central Government's main revenue mechanism – state-owned enterprises' profits -- and gave the impetus of decentralization of expenditure. Although the Tax Sharing System reform of 1994 (through the introduction of a value-added tax) enabled the Central Government's revenues to recover robustly a few years later, local governments continued to bear the main responsibilities of financing and provision of basic educational services, including ECDE. As the fiscal capacity varies from locality to locality, so does the capacity for service provision. Overall, subnational governments' revenue fell far short of their expenditure (see Figure 22). At the same time, as market reforms brought a big realignment of prices, the costs of providing public services rose rapidly, affecting service delivery in the rural areas. However, the increase in income of urban residents has led to a rising demand for ECDE services.

Figure 17: Number of Kindergartens in China, 1986-2006 (Unit: 10,000)



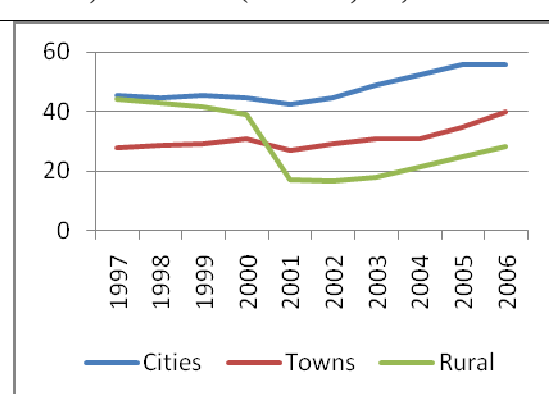
Source: MOE 2009.

Figure 18: Enrolment in Kindergartens in China, 1986-2006 (Unit: 100,000)



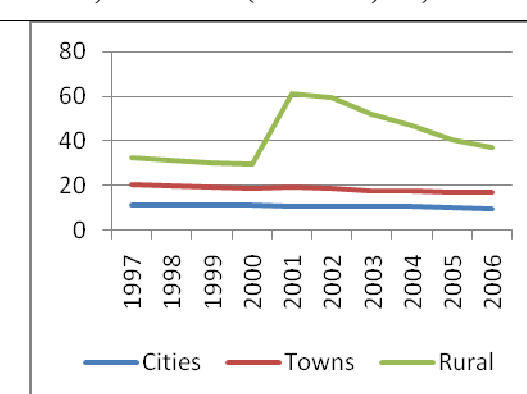
Source: MOE 2009.

Figure 19: Number of ECDE Teachers in China, 1997-2006 (Unit: 10,000)



Source: MOE, 2009.

Figure 20: Number of Pupils per Teacher in ECDE, 1997-2006 (Unit: 100,000)



Source: MOE, 2009.

Figure 21: Trends in Budgetary Revenues and Expenditures

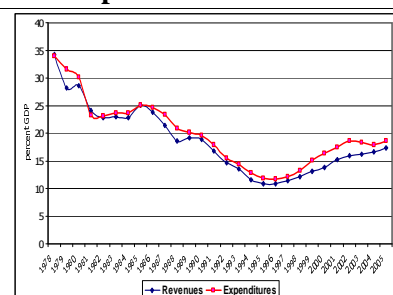
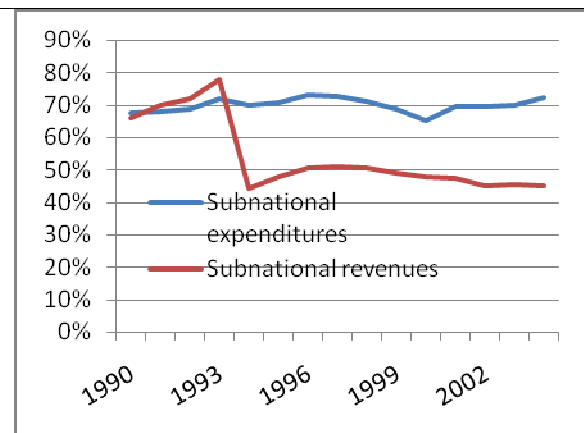


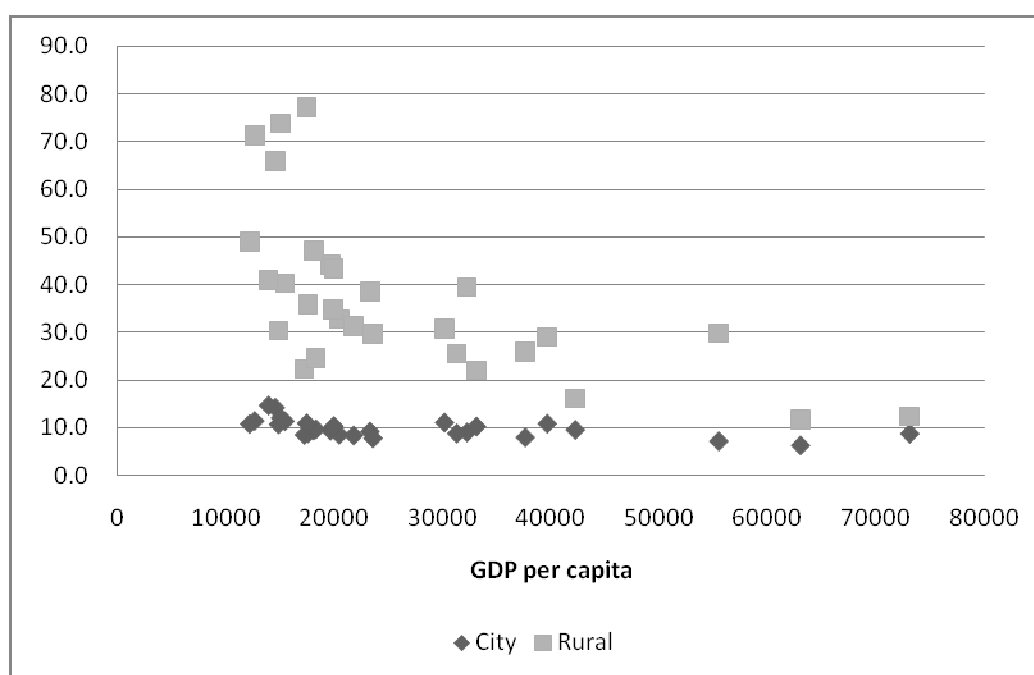
Figure 22: Fiscal Imbalance in Subnational Governments



Source: China Finance Yearbook, various years

The pupil-to-teacher ratio is a good indicator of quality of inputs. The national average is 17:1, but it is 9.5:1 in the cities, 19:1 in county towns, and 34:1 in rural areas. Variations in the pupil-to-teacher ratio across provinces are large, particularly in rural areas, ranging from 8:1 in Shanghai to a staggering 167:1 in Ningxia (an arid autonomous region of the Hui Muslim in northwest China) and 164:1 in Guizhou (the poorest province in southwest China) (see Figure 23). In large classes, it is not possible to have a child-centered approach; there bound to be insufficient individual attention to development of language and cognitive skills. In one-year pre-primary classes, there is a strong tendency to teach primary curriculum. Reading and writing are common activities in these classes. It is also easy to handle in large classes.

Figure 23: Pupil-to-Teacher Ratio in Rural Areas by Province, 2008

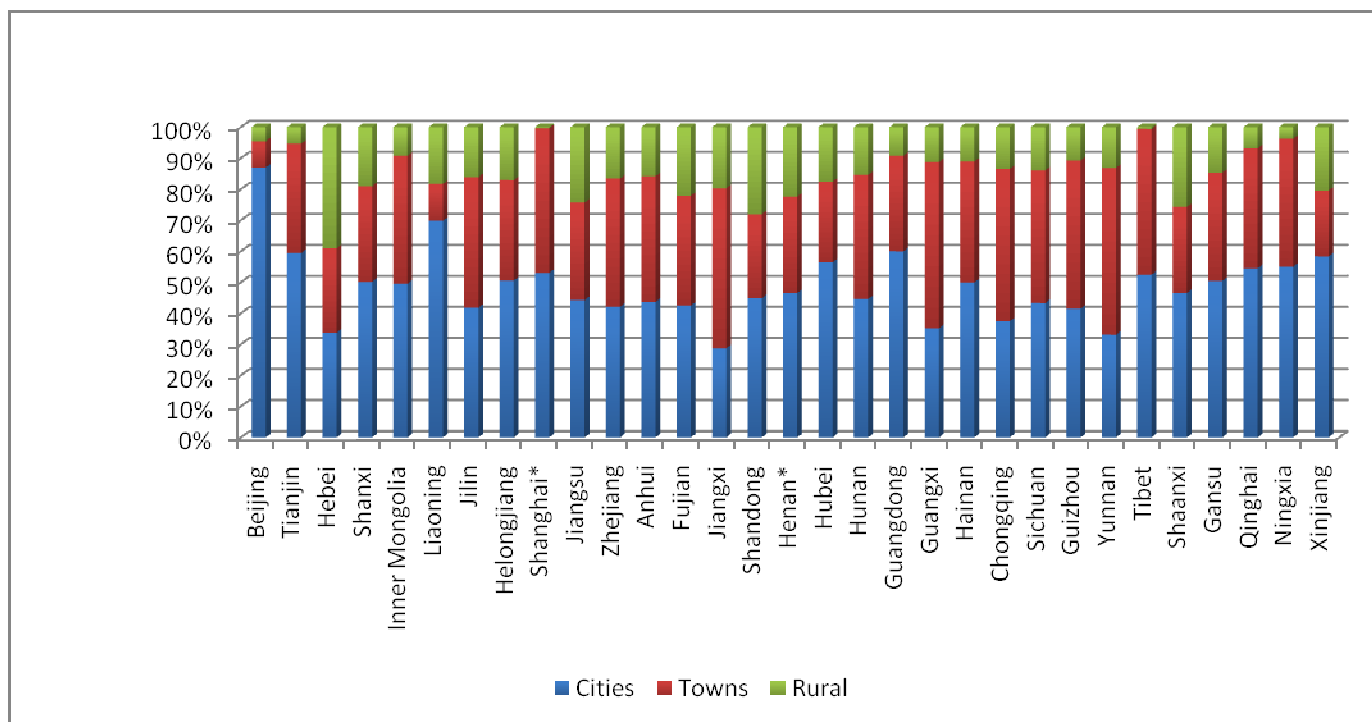


Source: MOE, 2009. Note: Ningxia and Guizhou are outliers and omitted from the graph.

The differences in quality between rural and urban areas are also reflected in academic qualification of teachers. In the cities, 48 percent of teachers in public kindergartens and pre-primary classes have specialized teacher qualification and above; this percentage drops to 34 in towns, and 18 in rural areas. Figure 24 shows the variations of teacher qualification by province.

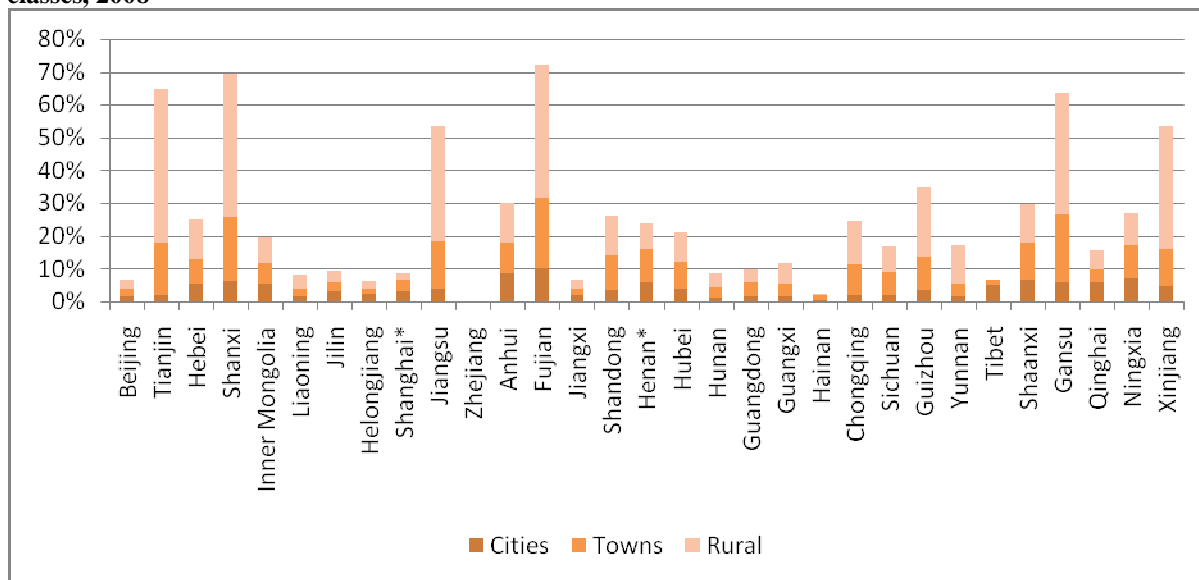
Another indicator is the percentage of substitute teachers in public kindergartens and pre-primary classes. The national average is 6.5 percent. In rural schools, substitute teachers account for 13 percent of total, compared with 3 percent in cities and 7 percent in towns. Figure 25 shows the percentage of substitute teachers by province. There is a difference in qualification and quality between regular and substitute teachers.

Figure 24: Percentage of Teachers with Specialized Training in Public Kindergartens and Pre-primary Classes, 2008



Source: MOE, 2009.

Figure 25: Substitute Teachers as Percentage of Total Teachers in Public Kindergartens and Pre-primary classes, 2008



Source: MOE, 2009.

Available statistics show the differences in teacher qualification and substitute teachers in public kindergartens. There is no information on these indicators in private kindergartens, and certainly none in nurseries. However, about 60 percent of enrollment is in private institution. While this is beyond the scope of this study, it is advisable to policymakers in ECDE to collect data in private kindergartens in order to inform policy towards regulations and improvement.

2.5. Training and Standards of Service

There are separate training and standards for caregivers of 0-3 and 3-6. The content of training comes from education theory (particularly the Montessori school of thought), psychology, public health and medical information. Non-formal training offered to caregivers of 0-6 is often conducted in workshops and seminars, and in population schools, and is offered to parents as well. Government agencies such as NPFPC, MOH, MOE, MOCA, and Women's Federation often conduct seminars in a variety of settings. Well-organized kindergartens also invite child psychologist, early childhood educators, and pediatricians to give talks to parents.

2.51. Training and qualification of caregivers of the 0-3 age group

The occupation standards of MHRSS govern the training content and qualification of caregivers of the 0-3 age group. Training is conducted in vocational high schools at the senior secondary level.

There are three levels for caregivers of babies and toddlers, from caregiver level to master and senior master. The knowledge and experience requirements are progressively higher. Caregivers are required to complete junior secondary education, and to take no less than 80 standard learning hours of course work. Master caregivers are required to have five years of relevant working experience and no less than 100 hours of course work. Senior master caregivers are required to have seven years of relevant experience and have no less than 120 hours of course work. A major requirement for admission is a personality with compassion and respect for children, and with the ability to learn. Basic knowledge includes physiology, psychology, nutritional and educational needs of children aged 0-3, as well as relevant laws governing the care of this age group. Caregivers are trained to handle real life situation, such as feeding, creating comfortable environment for sleeping, bathing, changing diapers and clothing, ensuring hygienic conditions of the living environment, and sanitizing toys and food utensils. With respect to health, the caregivers are also trained to monitor growth, to follow the immunization schedule, to prevent illness, to deal with common childhood illness and injuries, and to recognize the symptom of lead poisoning. With respect to education, the caregivers should be able to help babies and toddlers to develop gross and fine motor skills, to acquire language, to build good social skills and characters, and to impart simple cognitive and mathematics skills. The caregivers should be able to plan for individualizing the instruction, assess babies' developmental progress, and guide the training of babies in developing the aforementioned skills.

Experts and service providers tend to think of how caregivers could provide care and education to babies and toddlers. However, the vast majority of young children are living at home and being cared for by parents or grandparents. Therefore, there is a need to build a new occupation for the educators of parents and primary caregivers at home.

2.5.2. Education and qualification of teachers and teaching assistants of the 3-6 age-group

Teaching assistants in kindergartens, social welfare institutes, and childcare centers provide care to children and support teachers. There are three levels – elementary, middle and senior. Teaching assistants at the elementary level have finished 120 hours of training. Assistants at the middle level have had five years of experience and 140 hours of training; and teaching assistants at the senior level have had five year of experience after they have completed the middle level training, and 160 hours of training. Assistants at the elementary level are required to have the basic knowledge on physiology, health and hygiene, psychology, education, common diseases among child children, infectious diseases, first aid on common accidents and injuries, nutrition, and relevant laws. The skills include being able to sanitize the environment, being able to provide on a daily basis three meals a day, bathing, toiletry, and getting the children to sleep, to follow immunization schedule, and to support the teacher in all indoors and outdoors activities. From the safety point of view, they should be able to ensure safety, prevent injury, and educate children about safety.

There are also professional requirements for kindergarten teachers. They are prepared in vocational high schools, specialized secondary schools (which are normal schools at the senior secondary level), 3-year tertiary education institutions, and universities. They follow the curriculum set by the MOE. An ECDE teacher must be certified. Their ability to speak Mandarin must met the minimum standard of attaining a B grade, and they must pass the examination on child psychology and education.

There are two channels to obtain the qualification. The first one is to go through senior secondary level normal school with a specialization in early childhood education, or a tertiary level normal institution, or normal universities. Their curriculum will include three theory courses -- early childhood education theory, child psychology and child health -- and six teaching method courses – language, common knowledge, mathematics, music, arts and crafts, and physical education. Students specialized in ECDE have to learn to draw, dance and play a musical instrument in order to qualify to be a teacher. They also have to do a practicum of six weeks' duration in a kindergarten. The entire training takes about 3 to 4 years. They will obtain early childhood teachers' certification on graduation. Those who were not educated in normal schools but are graduates from senior secondary schools can take part in training for ECDE to obtain qualification and the certification to teach. They will have to take an examination in early childhood education, child psychology, Mandarin, and teaching of young children.

Since the implementation of the *Law on Teachers* in 1993, ECDE graduates can apply for teachers' certificates. In 2003, the State Council issue the *Directives on Early Childhood Education Reform and Development* that defines clearly in-service training of ECDE teachers, and treats them as part of the professional development. While there is a progressive improvement in raising the standards of ECDE teachers, the linkage between pre-service and in-service training has yet to be worked out and coordinated. There is a common understanding that applying the pre-service curriculum to in-service training will be adequate for teacher professional development, but this is not true.

In fact, teachers often encounter cases that they were not taught before. An example is autistic children, who are on the rise and are often misdiagnosed. These children respond to their peers far better than to adults. Mainstreaming and early intervention of autistic children can mitigate the severity of the disease. The separation of special education and ECDE is strictly maintained in pre-service training, but in real life, it is blurred. However, teachers who are not aware of the symptoms and techniques could not be of help to these children. Onsite training and networking of teachers to deal with autistic children is now being done a few schools in Shanghai.

Future pre-service and in-service education and training could be more inclusive in terms of the emerging problems so that they could address the issues facing children at risk in a more effective manner. The new problems could well include psychological and safety problems of children who are left behind by their parents, and the psychology, nutritional status and safety of girls.

There are also regulations on facilities, for example, on the number and types of rooms, square meters per students, toilets, kitchen, and outdoor space. Annex 8 provides an example of the regulated space for urban kindergartens.

Chapter 3: Financing of ECDE

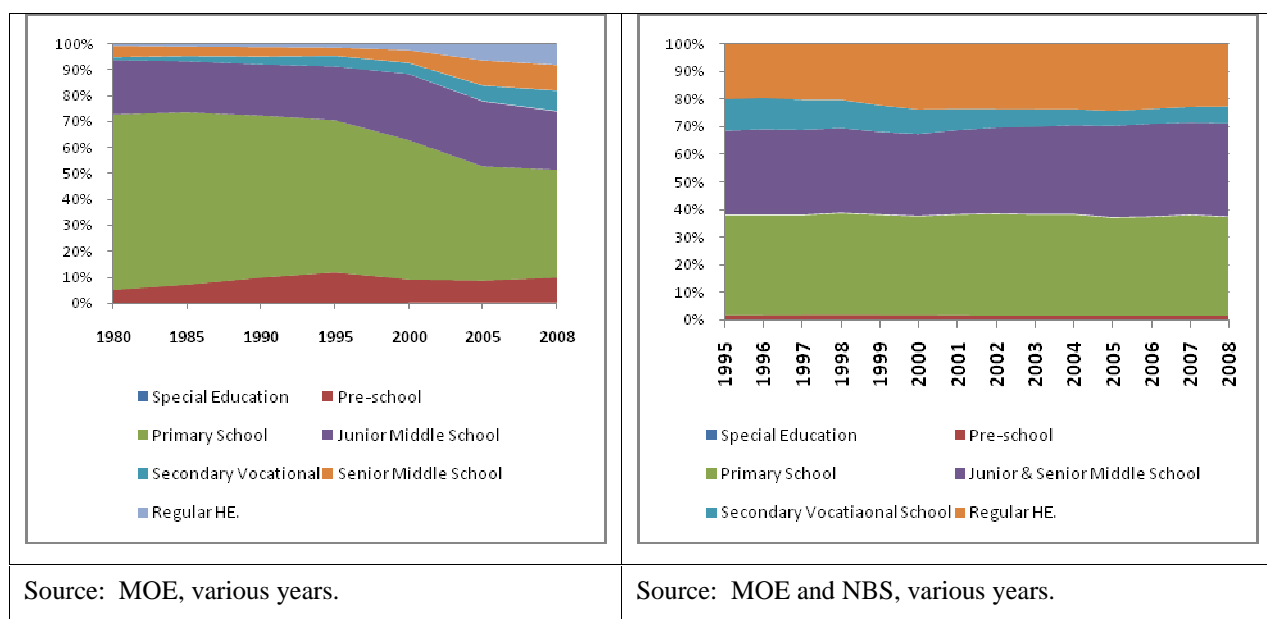
The disparity in access to service has its roots in the decentralized system of finance. Although China is highly centralized in terms of policy and regulation, it is highly decentralized in finance and administration. The current expenditure assignments put the largest financial burdens on the lowest levels of government – county governments in rural areas and district governments in municipalities. In 2008, governments at the county and township levels accounted for 45 percent of total budgetary spending on education, compared to 10 percent for the central government, 45 percent for provinces.

The central government places great emphasis on providing 9 years of free compulsory education for good reasons. The rural compulsory education finance reform during the 11th Five-Year Plan (2006-2010) exempted miscellaneous fees for all rural students, gradually eliminated textbook fees for all students, and provided targeted boarding subsidies to poor students. Central fiscal transfer covers 80 percent of the cost to compensate for the elimination of fees in 12 provinces in the western region, and 60 percent in ten provinces in the central region. The richer coastal provinces and urban areas were required to use their own resources to finance free compulsory education. In 2008, miscellaneous fees and textbook fees were abolished nationwide. The substantial increase in budgetary expenditure per student in compulsory education was made possible not only by China's growing wealth, but also by the decline in school-age population (Figure 26), while intra-sectoral budgetary allocation remained stable over time (Figure 27).

In ECDE, however, while enrollment had increased from 1980s, the share of budgetary expenditure has hardly changed (see the bottom band in both Figures 26 and 27). In fact, the share of expenditure allocation to ECDE is so small that it is barely visible in the graph.

Figure 26: Shifting shares in student enrolments across subsectors, 1985-2008

Figure 27: Budgetary Expenditure on Education by Subsector, 1985-2008



ECDE programs are fee charging because they are not part of compulsory education. Local governments do not have the fiscal capacity to fund ECDE. In the course of rapid economic development and as government functions are still in the process of evolution, some local governments with relatively stronger finances often give priority to support for industry, and second to investments that build the local image. Relatively much less attention has been paid to investments in human development because the economic returns have a much longer time horizon. Even public kindergartens and pre-primary classes are fee based. About 40 percent of enrollment in ECDE is in private institutions, which may be for-profit or non-profit. Private, household spending accounts for most of the finances in this sector. As such, the inability to pay is the key barrier to access. Table 7 shows the sources of funds in different types of ECDE services. This chapter looks first at public finance and then private finance of ECDE services.

Table 7: Main Sources of Funding for ECDE Programs in China, by Type of Service and Management

Type of Service and Management	Main Source of Funding
<i>Formal Kindergartens/Pre-Primary Classes (for children ages 3–6)</i> <ul style="list-style-type: none"> Public Affiliated with enterprises, institutions, governmental bodies, etc. Urban neighborhoods and collective units Rural neighborhoods and collective units 	<ul style="list-style-type: none"> Budgetary appropriations by enterprises, institutions, governmental bodies, etc. Collection of fees Some subsidies available for capital costs Local (township or village) government Public dues Donations Collection of small fees
<i>Informal Care and Education Institutions</i>	<ul style="list-style-type: none"> Donations from non-state sectors and other funds raised by institutions

- Collection of fees

Source: UNESCO, 2003.

3.1. Public Expenditure on ECDE

In 2009, China's budgetary spending on education was 3.5 percent of GDP, an increase from the historical trend of under 3 percent throughout most of 1980s to 2007. Given China's double digit economic growth rate over the decades and the increase in government revenue, this amount represents an increase in real terms in the aggregate and on a per student basis for all subsectors in education. However, this level of public spending is still below the 4 percent of GDP called for by the country's own Education Law, and is much lower than OECD's average of 5.7 percent (OECD, 2010). To compensate for this shortfall, the *Outline of China's National Plan for Medium and Long-Term Education Reform and Development 2010-2020* (2010) states that that public expenditure on education will be given priority and protected in the budget process, in order to guarantee that the increase in allocation to education be higher than that in regular revenue. Specifically, 3 percent of value added tax, business tax, consumption tax will contribute to educational surcharge used only for education purposes. The target is to increase public spending on education to 4 percent of the GDP by 2012.

At present, however, intra-sectoral allocation of budgetary expenditure does not reflect the share of student enrollment in the system as a whole. Higher education accounted for 13 percent of the total enrollment but received 30 percent of the total budget. This share is much higher than India and Indonesia (18 percent), Japan (15 percent), and South Korea (14 percent). Budgetary expenditure on compulsory education (primary and junior secondary) is below their share of total enrollment. Pre-primary education is the most seriously under-funded. This subsector accounts for 9 percent of total enrollment but receives only 1.3 percent of the budget (Table 8).

Table 8: Enrollment Share and Budgetary Share and Intergovernmental Finance, 2008

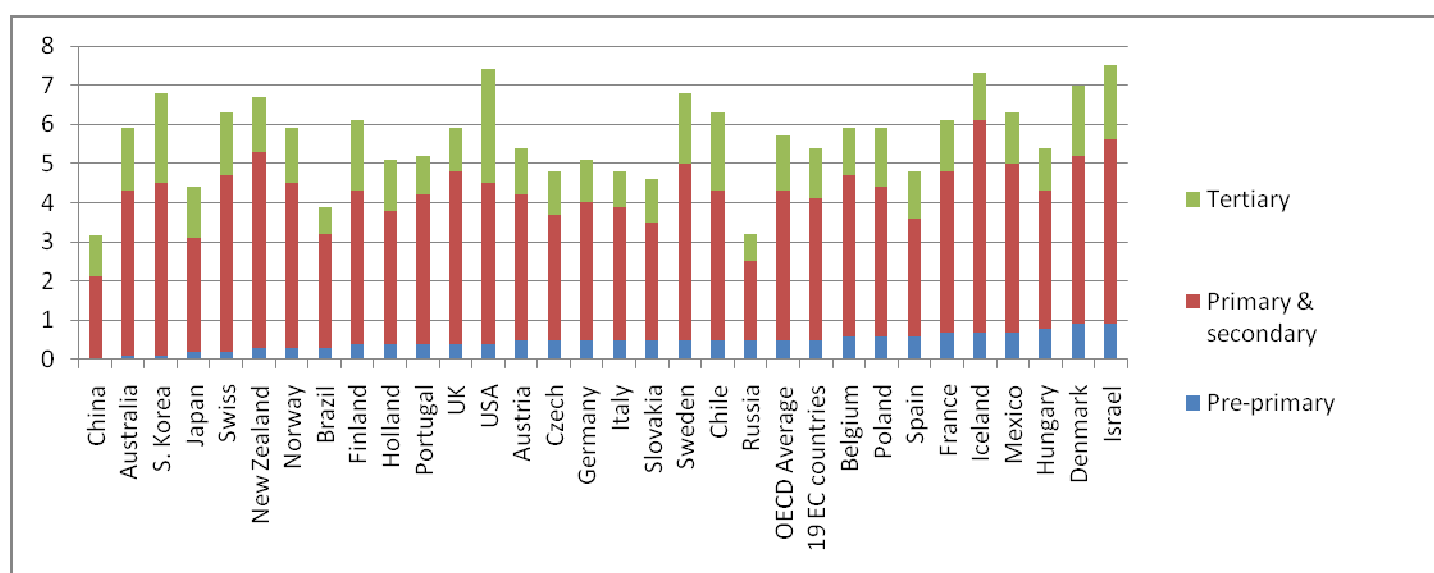
	Enrollment	Budgetary Spending	Intergovernmental Finance
Higher Education	13%	30%	MOE, Provinces, Autonomous Regions, Municipalities
General Senior Secondary	9%	11%	Provinces, Autonomous Regions, Municipalities
Technical and Vocational	8%	7%	Provinces, Autonomous Regions, Municipalities
Junior Secondary	21%	18%	Counties, Districts
Primary	40%	25%	Counties, Districts
Pre-Primary	9%	1.3%	Counties, Districts
Special Education	0.14%	0.29%	Counties, Districts
Others (administration, etc)	N/A	6%	
Total (%)	100%	100%	
Total (in numbers)	267 million students	RMB1,399 Billion (\$200 Billion)	

Source: China Educational Finance Statistical Yearbook 2009; China Education Statistical Yearbook, 2009.

The reason for such a low level of public spending on ECDE is because the responsibilities for financing and provision of service rest with the county governments in rural areas, just like compulsory education, whereas the responsibility for financing and provision of post-compulsory education (senior secondary education, TVET, higher education) rests with the provincial government. The lack of fiscal capacity of county governments has constrained supply of ECDE service. However, provincial governments are in a better financial position because they can raise funds through borrowing for capital investment, including to the World Bank for TVET.

China's budgetary spending on ECDE is 1.3 percent of the total budget on education. This is extremely low by international comparison, as pre-primary education commonly claims 6-8 percent of the total education budget. Demark is the highest spending country, devoting 20 percent of its total public expenditure on ECDE. France and Spain follow closely, both spending above 17 percent of the total education expenditure (see Figure 28). Mexico spends about 13 percent of its public expenditure on ECDE (OECD, 2008). As a percentage of GDP, China spent about 0.01 percent on ECDE. Figure 28 shows the share of public spending on ECDE vis-à-vis that of primary, secondary and tertiary education in OECD for comparison.

Figure 28: Cross Country Comparison of Public Expenditure on Education by Level as a Percentage of GDP



Source: OECD, 2007; MOE and NBS, 2008.

The current policy in China provides for heavy subsidies for compulsory education, and uses cost recovery for pre-primary education and post-compulsory education. However, the cost recovery impact of post-compulsory education is mitigated by the availability of annual stipends

up to RMB1,500 (\$220) to all TVET students and general senior secondary education students in poverty, and by grants and loans in tertiary education. Student financial assistance in tertiary education covers about 15-20 percent of all students. But grants and loans are not made available to support the poor and vulnerable to access ECDE services.

In China, spending per student on ECDE is high compared with spending per student on primary education. Table 9 shows that budgetary spending on ECDE per student is 1.1 times over that of primary education; when extra-budgetary spending is included, it is 1.5 times over that of primary education. By comparison, in OECD countries and Brazil, public spending on ECDE is less than that of public spending on primary education per student. Only Chile's per student spending on ECDE in proportion to its public spending per student in basic education is as high as China's. The average high cost of ECDE makes it harder for local governments to finance its expansion.

Extra-budgetary spending, which mostly come from tuition fees, accounts for 43 percent of the total spending, while budgetary spending accounts for only 56 percent. By comparison, extra-budgetary spending accounts for only 20 percent in primary education, 26 percent in junior secondary education, 13 percent in senior secondary education and TVET. The magnitude of extra-budgetary spending on ECDE only exceeded by that on tertiary education (58 percent) (Table 9 and Annex 4).

Table 9: Public spending per student in various subsectors in comparison with spending on primary education (primary education =1)

	ECDE	Primary	Junior Secondary	Senior Secondary	Tertiary
China (2008)					
Budgetary	1.1	1.0	1.2	1.4	3.6
Total*	1.5	1.0	1.3	1.3	6.9
OECD Average (2005)	0.8	1.0	1.2	1.3	1.8
USA	0.9	1.0	1.1	1.2	2.7
South Korea	0.5	1.0	1.2	1.7	1.6
Japan	0.6	1.0	1.1	1.2	1.8
Brazil (2005)	0.9	1.0	1.7	0.6	7.0
Chile (2005)	1.5	1.0	1.0	1.0	3.4

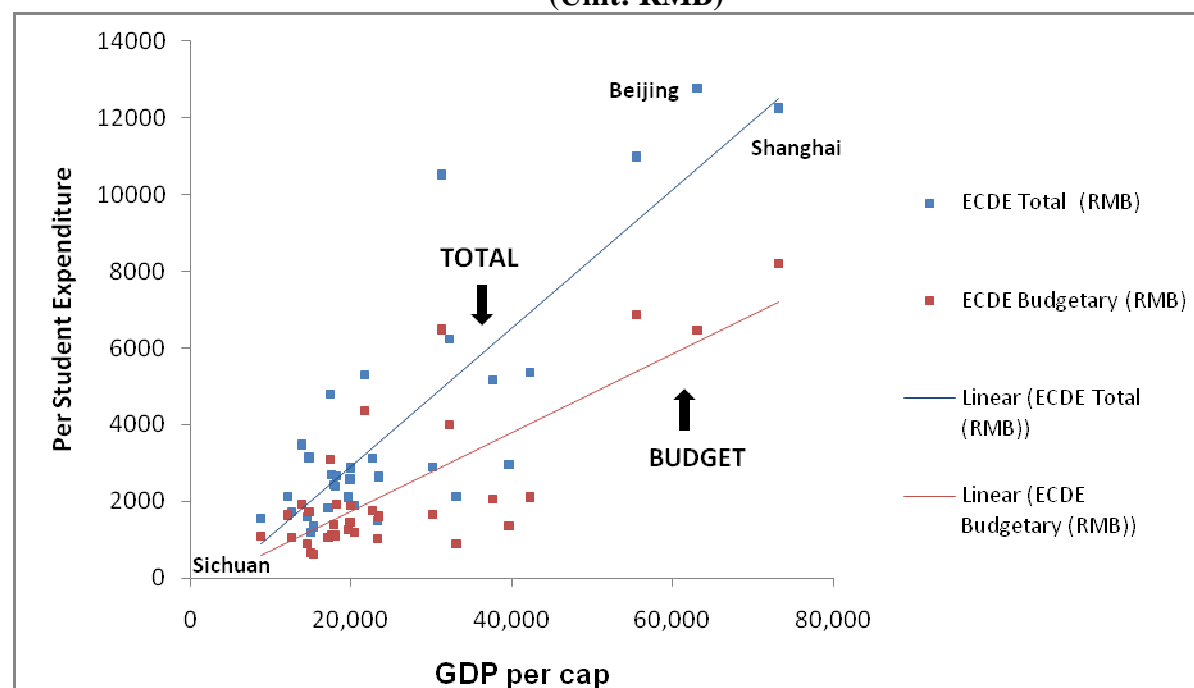
Source: MOE and NBS, 2008; OECD, 2008. Note: *Total includes both budgetary and extra-budgetary spending which includes fees and donation

There is a huge range of per student public spending across provinces and within provinces in all subsectors. Figure 29 plots the provincial per capita GDP against the provincial budgetary expenditure, as well as the total expenditure by provinces (which include both budgetary and extra-budgetary expenditure) (also see Annex 4). Extra-budgetary expenditure comes from tuition fees, own-generated income, and donation. In ECDE, fees account for the bulk of the extra-budgetary expenditures. In Figure 29, the trend lines of budgetary and total expenditure show the wide divergence between the poorer and rich provinces and municipalities. Shanghai had the highest per capita GDP in the country (RMB73,124 or \$10,754) and also the highest budgetary spending per student on ECDE (RMB8,319, or \$1,223) as well as other subsectors, except higher education. Shanghai spent 13 times more than Sichuan (RMB 638), and Guangxi (RMB662), and 9 times more than Shandong (RMB912). Furthermore, Shanghai's budgetary expenditure on ECDE is higher than tertiary education budgetary expenditure per student in 24 other provinces.

Due to the policy of free compulsory education, the budgetary allocation to primary and junior secondary education is higher than that in other subsectors. While this is commendable, given the significant impact of ECDE on poverty alleviation and improvement of school readiness, under funding of ECDE is likely to exact a high social cost.

The divergence of spending per student by province also captures the disparity in quality. Compared with other subsectors, ECDE has the biggest range of budgetary and extra-budgetary spending per student between the top spending municipalities and the lowest spending province. Ironically, the wealthier provinces (e.g., Zhejiang) have lower budgetary allocation, because parents are also more willing and able to pay out of pocket.

Figure 29: Budgetary and Total Spending Per Student on ECDE by Province in China, 2008
(Unit: RMB)



Source: MOE, , 2009.

In industrialized countries, the extent of state support for ECDE tends to be related to the labor force participation of women and societal attitude towards the family. Table 10 shows that Nordic countries offer high family welfare and child care, thereby making it possible for women to participate in the labor force. English-speaking countries, such USA, Canada, UK, Australia and New Zealand, rely on the family and the market to meet the need for child care, resulting in lower female participation in the labor force than northern European countries. In continental Europe, family welfare is high but female participation is relatively low as the societal attitude is that women will take care of children. Yet, attendance in kindergarten is very high, over 100 percent in Germany and France. Japan and Southern European countries rely on the market and families to deal with child care. China has relatively high rate of female participation in the labor force, 62 percent in urban areas and 79 percent in rural areas. In this sense, it is in the category of English-speaking countries that rely on the family and market to deal with child care.

Table 10: Labor Force Participation of Women and Child Care Policy

Labor Force Participation of Women	Child Care and Family Welfare	Countries
Very high	The State provides for high family welfare and childcare	Finland, Sweden, Denmark, Norway,
Relatively high	Family and the market bear responsibility for child care. There is no comprehensive family welfare.	USA, UK, Australian New Zealand, Canada, China
Relatively Low	Policy revolves around female assumption of childcare but family welfare is high	France, Germany, Belgium, Austria, Holland
Low	Responsibility for childcare rests with family and the market	Iceland, Ireland, Portugal, Italy, Spain, Switzerland, Japan

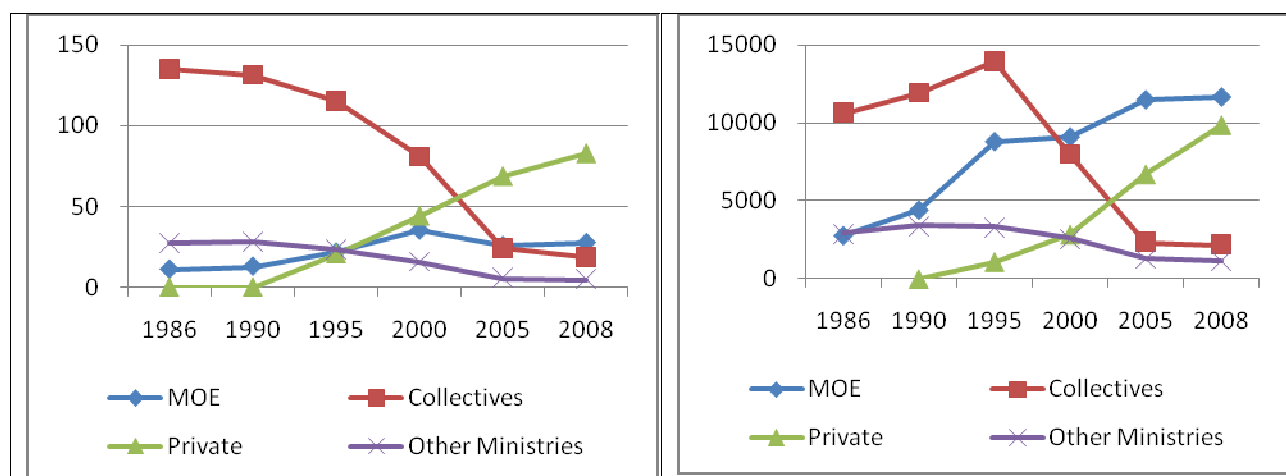
Source: Liu, 2009.

3.2 Private Finance and Provision

Before the reform of 1978, all kindergartens and childcare facilities were in the public sector, run by ministries, state-owned enterprises, and collectives. After the transition to a market economy, these public sector agencies separated welfare services such as kindergartens from their core business in order to cut cost. Some of these kindergartens became private, run by the retrenched staff. Over time, an increasing number of kindergartens, particularly those in the cities and towns, are established by private individuals or groups and run like a business. Given the family planning policy, families tend to spare no efforts and means to provide the best for their children. This has largely fueled the development of the market for private ECDE. Figure 30 shows that while no private kindergartens were in existence in 1986, 60 percent of kindergartens were private by 2008. However, many private kindergartens are very small, and hence, the enrollment share in private kindergartens was only 40 percent, as shown in Figure 31.

Figure 30: Shifting Share of Kindergartens by Ownership, 1968-2008 (Unit: '000)

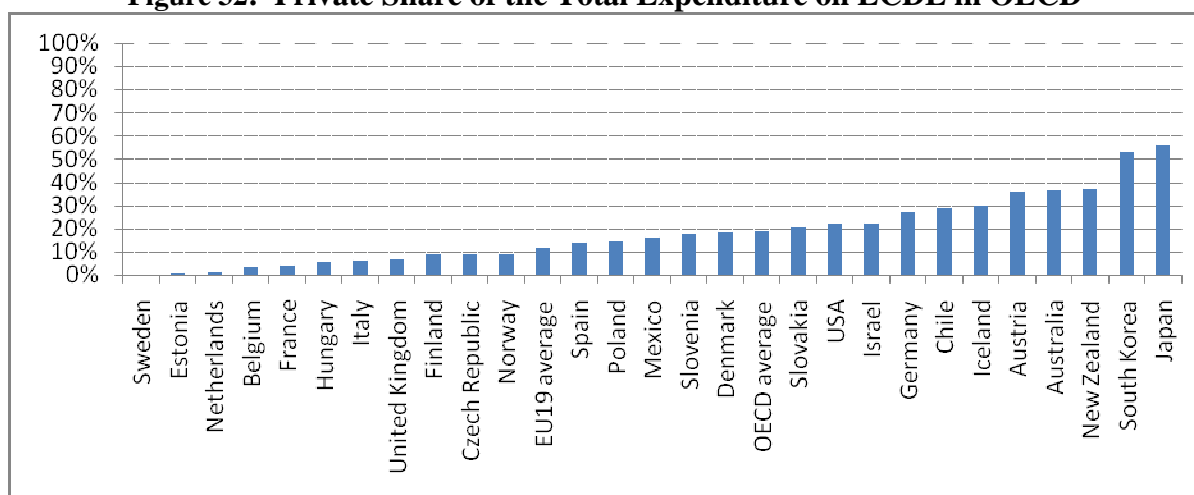
Figure 31: Shifting Share of Enrollment by Ownership of Kindergartens, 1986-2008 (Unit: '000)



Source: MOE, various years.

As ECDE is financed by user charges, inability to pay is a barrier to access. It is estimated that private expenditure account for about 70 percent of the total expenditure in China, probably topping all OECD countries (Figure 32).

Figure 32: Private Share of the Total Expenditure on ECDE in OECD



Source: OECD, 2009.

There is a huge range of fees charged in kindergartens. On the whole, public kindergartens have lower monthly fees but higher sponsorship fees. The monthly fees cover the cost of teaching and learning materials (mostly consumables such as papers for drawing) and food. Government subsidies cover salaries of teachers and staff and provision of the premises. Annex 5 provides the fee structure of one-year pre-school classes in selected provinces. Annex 6 provides the monthly tuition fees in kindergartens in Shaanxi.

Sponsorship fees are used to buy equipment (e.g., HDTV, computers, DVDs, musical instruments), and to undertake repair and maintenance, and beautification of the premises. These can be very hefty. Public kindergartens tend to be of better quality with more space and better qualified teachers. The demand for them is also high, making it possible to charge high

sponsorship fees. Annex 7 shows a range of the fees charged by different types of kindergartens in Guangzhou.

Private kindergartens are free to set fees, but need to report to the local government and approval is pro forma. The rate is essential market based. For example, in Guangzhou, fees of kindergartens are classified into three categories:

- The most expensive cost about RMB30,000-50,000 (\$4,411–7,353) per year inclusive of sponsorship fees, management fees, food, boarding, insurance, uniforms, books, notebooks, computer, utilities (air conditioning) and activities. These tend to be Chinese-English bilingual kindergartens. In these kindergartens, there is a health room, a dance room, a game room, and a drawing room. Teachers have high qualifications.
- The medium range is RMB800-3000, over and above sponsorship fees.
- The least expensive are public kindergartens and very small scale private kindergartens, charging RMB 130-800 over and above sponsorship fees.

To put the fee levels of public and private kindergartens in perspective, it is important to remember that in 2008, the rural average income is RMB 5,135 and some 35.97 million people lived below a per capita annual income of less than RMB1,196. Thus, the inability to pay is the main barrier to access on the demand side, and the non-availability of kindergartens is the barrier to access on the supply side. Without intervention, ECDE could become education for the elite.

3.3. Cost Driver in ECDE

High quality ECDE is children- and activity-centered which would require low pupil-to-teacher and pupil-to-staff ratios. But the activities and duration of service are also very different from compulsory education, requiring a lot more intensive supervision than older children. Furthermore, with the implementation of family planning policy, parents who can afford it, are willing to pay, in order to give their only child a head start. The following section examines the characteristics of ECDE to understand why it cost as much if not more than primary education per student.

3.3.1. Services for the 0-3 Age Group

There is no standard curriculum or centrally issued guideline for service provision. Instead, every provider defines its own offering, drawn from the theory of child development. Generally, parent-teacher classes and nurseries aim to stimulate babies to crawl and eventually to walk, to develop their sensory motor skills, language skills, confidence and curiosity. Box 3 describes some of the activities in parent-child classes. The labor-intensity of this kind of services almost ensures high cost.

Box 3: National Population and Family Planning Commission's Early Child Development Centers

In the country that has only 7 percent of the world's land (of which less than half is arable), but 20 percent of the world's population, the NPFPC has played a key role in stabilizing the population to ensure the people can meet their basic needs for food and clothing, and to enable a more harmonious relationship between economic development, resources and the environment. The NPFPC aims to undertake long-term and effective measures to raise the quality of the population. For this reason, NPFPC gives top priority to raising the overall quality of human development, emphasizing ECDE to give children a head start. The services of NPFPC range from counseling on family planning, supply of contraceptives, provision of pre-natal and post-natal care to family-based care and elder care, immunization and early childhood development. The service for ECD includes providing exercise classes for pregnant women, early stimulation classes for infant and toddlers and their mothers, and outreach to rural areas to advise on parenting skills and child growth monitoring.

With the instruction and supervision from NPFPC, around 50 demonstration Early Development Centers have been established national wide. Those centers provide prenatal classes, baby swimming lessons (in a bath tub), parent-child classes "Qinzi" classes, which are grouped by age clusters of 9-15, 16-22, 23-29 and 30-36 months, and also regular nurseries. In those Centers, service is based on fees or monthly subscription.

The parent-child classes may have 10 or more children and their parents/grandparents, or nannies. There are organized activities such as play, song and dance, and exercises designed to develop motor skills. A qualified instructor provides guidance in these structured activities. The Qinzi classes are organized through the day and evening, but mostly on the weekends. Fees are charged on an hourly basis, ranging from RMB 50 to 120 per hour. For nurseries, the fees are on a monthly basis. These Early Development Centers provide the venue for the single-child to interact with other children and for parents to exchange experiences.

In Early Development Center in the Qinghe County of Hebei Province has about 160 children from 2-6 and another 600 attends classes/sessions offered by the Center. About 80 children are on the waiting list. The facility is well equipped and staffed. The head of the program is well versed on early care and development and was trained in maternal and child health. The Center also offers an outreach program to train village staff on home visiting within the county. It has also developed and published a set of ECDE materials which is distributed county wide.

Source: World Bank mission visit in July 2009.

3.3.2. Services for the 3-6 Age Group

ECDE aims to provide experiential learning, so that children will achieve an all rounded development through various “organized and guided activities.” ECDE aims to promote children’s physical, cognitive, language, emotional, social development, and development of fine and gross motor skills. The aim of ECDE is comprehensive and developmental. The content needs to be rooted in life so that children can relate to, and abstract concepts can only be taught at a later stage. The knowledge has to be integrative and so the subject has to be related to each other. Plays and toys are used to stimulate imagination and curiosity and help children learn different roles in society. The type and level of activities must be appropriate to the age of children. The development of more abstract concepts takes place at a later age.

MOE’s *Guidelines on Kindergarten Education* (2001) emphasizes the formation of good habits, initiatives, curiosity, and eagerness to learn. The content of ECDE is divided into health, language, social, science and art domains, and requires the integration of attitudes, feelings, cognition and skills. This led to major changes in ECDE approaches. Thematic approaches (such as seasons, festivals) are adopted to teach related concepts, and different activities are organized to teach these themes.

The activity-based approach gives kindergarten directors and teachers much discretion in determining its offerings. However, also because of the need for space in order to undertake various activities, the space requirement is also quite generous. Considering the high cost of real estates, particularly in Chinese cities, land cost/rental cost is a major driver (see Annex 8 for the regulation on facilities of kindergartens).

Pre-primary classes are supposed to ease children’s transition into compulsory education, but there is a tendency to advance the curriculum in primary 1 to pre-primary classes, teaching mathematics, language, reading and writing. There is not plenty of time to play. Table 11 presents a comparison of kindergarten and primary education activities. Box 4 offers a glimpse into a day in the life of a kindergarten in Changchun city, in Jilin Province in Northeast China.

Table 11: Comparison of Instructional Time, Classroom Management and Instructional Approaches between Kindergarten and Primary Education

	Kindergartens	Primary Education
Duration of class	1-1.5 hours of collective instruction, 30 minutes per session, others are games, plays, physical activities.	Collective Teaching, instructional time last 4-4.5 hours per day for 40 minutes each session.
Classroom management	Changes of activities five times per day.	Strict class and recess time
Instructional approach	Centers around games and plays, develop fine and gross motor skills, cumulate experience and knowledge by doing.	Follow centrally defined curriculum guidelines, teachers required to deliver curriculum, focus on learning process and test learning outcomes.
Relationship between teachers and students	At least two persons (teacher and assistant) supervise a class; there is adult supervision every single minute.	5 to 6 teachers will teach different subjects of a given grade. There is a turnaround of teachers at the end of a session. No supervision between classes.
Content of instruction	Concrete, visual, lively transmission of knowledge.	Teach systematic knowledge and abstract concepts. A single teacher can use traditional method of stand and deliver to teach a large class.

Children are prepared for primary education at the last year of kindergarten by focusing on completion of a task within a given time frame, to be self-directed, to have self-discipline, to be able to express their needs and questions orally. Kindergarten thus provides the transition to the life of compulsory education.

In summary, the labor intensity of teaching and supervision, and the need for space for a variety of activities has contributed to the high cost. For policymakers, the question is whether China could afford to universalize this expensive type of education. The answer is that other low-cost but high quality modes of delivery should be explored.

Box 4: A Day in the Life of a Kindergarten in Changchun, Jilin Province

There were 26 children (5-year-olds), one teacher and very few toys. Most of the children brought their toys from home. Kindergarten provides afternoon naps but children slept in their classrooms on foldable beds. Every child has a book bag where they put their books, clothing, food and toys.

7:30—8:20:	Entering kindergarten, breakfast.
8:20—8:50:	Free activities – children could play, go to toilet.
8:50—9:20:	Instruction on numbers. Add and subtract numbers lower than 10. Most kids did not understand but recited the multiplication table.
9:20—9:30:	Rest, drink water, go to toilet, play.
9:30—10:00:	Learn pinyin (use of Latin alphabets to represent sounds in Chinese). Teacher required children not to speak to each other or walk around, and put their hands on the desk. If students answered correctly, the teacher would praise him. Those who did not pay attention were asked to stand aside as penalty.
10:00—10:10:	Work sheet that required parental signature. Homework would take about half an hour.
10:40—11:10:	Washed hand in preparation for lunch.
11:20—11:50:	Half of the class was taking lessons on art and dance at extra charge. This lesson took place twice a week. For other students, they went to take an afternoon nap.
11:00—14:00:	Afternoon nap.
14:00—14:30:	Snack, fruit
14:30—15:00:	English class for 2/3 of students whose parents pay extra for them.
15:00:	Sing song, read books, then watch TV while waiting for parents to pick them up.

(based on October 2005, observation, see Liu, 2009)

Chapter 4. Determinants of Child Outcomes and Policy Implications

A review of national-level data in the above three chapters has found major rural-urban disparity in child health and access to service, as well as financial constraints on the supply of and demand for services. A review of the literature also found highly positive impact of ECDE services on child development outcomes. However, to inform policy and design targeted interventions, there is a need to fill the following information gap:

- How large are the disparities in weight, height, and social and cognitive development of children between rural and urban areas, between boys and girls, between Han and ethnic minorities, and between children cared for by their own parents and the left-behind children?
- Do enrollment in kindergarten, access to health check up, and good parenting/child rearing practices make a difference in weight, height, social and development of children, after controlling for rural and urban resident status, ethnicity, gender, left-behind status, educational attainment of mother and other caregivers, and family income?

A household survey was conducted in Hunan Province to collect data to address these questions.

4.1. The Hunan Household Survey

The Hunan household survey was conducted in March 2010 by the local staff of the NPFPC, with technical assistance of the World Bank and supplemental financial support of Save the Children-China Program. Hunan was chosen because its economy is primarily based on agriculture, its per capita GDP is at the lower-middle income level, and its human development index ranks 19th in the country thereby having instructive value for agrarian-based provinces which account for the bulk of the population. Furthermore, as a labor-exporting province, Hunan has a sizable population of left-behind children. The Province also has several ethnic minority groups, most prominently, the Miao, the Yao, and the Tujia, who also spread across other western provinces such as Guizhou, Yunnan, and Guangxi. It is in the national interest to promote ECDE among ethnic minorities in order to facilitate their development.

The survey took a sample of 15 counties and urban districts. Sampling began by selecting county-level units. All county-level administrative units in Hunan were sorted first into three types (first urban districts, then county-level cities, then regular counties). Within each type, counties were sorted by GDP per capita from the highest to the lowest. Then fifteen county-level units were randomly selected using probability proportionate to size (PPS) sampling. As none of the 15 counties have a heavy concentration of ethnic minorities, two minority autonomous counties were added in order to collect information on minority children and their families. These two minority counties, however, were analyzed separately, and the data were not pooled

with the main sample to avoid introducing bias to the mean. That said, a total of 17 counties/urban districts and 85 villages and urban neighborhood under them were surveyed.

Within these villages and urban neighborhood, 1,700 households with children between 37 and 48 months old were sampled by NPFPC staff, who kept detailed records of all children born. The 3-year-olds were targeted for observation because their development status captures the development outcomes of the first 36 months of life and also provides the foundation for subsequent development. Due to migration, only 1,011 households (60 percent of the original sample) were found and interviewed. No replacement was added to the sampled households. Of these households, only 821 respondents in the original 15 sampled counties, and 94 in the additional two minority counties provided complete information (see Annex 9 for a detailed description of the sampling method).

The survey has a questionnaire for the primary caregiver, who may be a parent or grandparent, or others. There are seven sections, covering: (i) basic information about the child (date of birth, birth weight and height, gender, ethnicity, rural/urban resident status); (ii) household characteristics, including parents' marital status, migration pattern, parents and other primary caregivers' educational attainment and occupation; (iii) primary caregiver's opinion on gender, childrearing practices (such as frequency of watching TV, reading to the child, playing with the child), attendance in parent-child classes and kindergartens, discipline; (iv) family conditions (including income and expenditures) and adult behavior (e.g. smoking in front of the child); (v) nutrition and diet, access to medical service and health habits (e.g. brushing teeth, washing hand after toilet and before meals), emotional responses in different situations and behavioral patterns of the child; (vi) details on siblings and educational status; and (vii) living conditions and household assets and debts. There are a total of 208 items.

There is also an instrument for direct observation by the survey workers on the child and a test of the child's cognitive skills. There are 47 items. These include testing whether the child can follow oral instruction (such as clapping the hands, going to the door), whether the child can imitate a jump and other fine motions, whether the child can explain the function of certain body parts, recognize written numbers from 1-10, recognize a triangle, a circle, and a square, and distinguish the expression of surprise and anger when shown pictures of other children. It took about two hours to complete the interview.

The design of the household questionnaire is informed by other household surveys, such as the World Bank's Living Standard Measurement Survey. However, questions specific for early childhood and to examine the left-behind children's issues are new addition. The sections on child nutrition, health, and social and cognitive development are informed by the conceptual framework presented in Annex 3. The questions on social development are informed by the commonly used instrument in USA, namely, "Strengths and Weaknesses" as well as by the questions in the Early Development Index (EDI). The questions on cognitive development are informed by USA's "Ages and Stages".

The Team has considered the technical benefits of using an internationally developed instrument in order to benchmark child development outcomes. Attempts were made to adapt the Early Development Index (EDI). Unfortunately, the EDI is a survey to assess a population (not for assessing individuals), and is based on the judgment of kindergarten teachers. EDI is not appropriate for the household survey in Hunan for several reasons: (i) the survey must be

household-based, not school-based, because many 3-year-olds are not in school; (ii) unlike the teacher, the primary caregiver, who is the respondent, has no other children as reference to judge his/her child's behavior and development; and (iii) EDI is designed mainly for children aged 4-7, but NPFPC's service targets are the 0-3 age group. While the design of the questionnaire is informed by the instruments of "Strengths and Difficulties" and "Ages and Stages" the former's minimum assessment age is 4, one year older than the study's target age group, while the latter contains questions that assess whether children can read the Latin alphabet, which is not appropriate for Chinese children. Recognizing that own-designed instruments carry validity and reliability risks without expensive and lengthy testing, the Team considered that it is still worth the risk to try out indigenous designed instruments which may be culturally more appropriate.

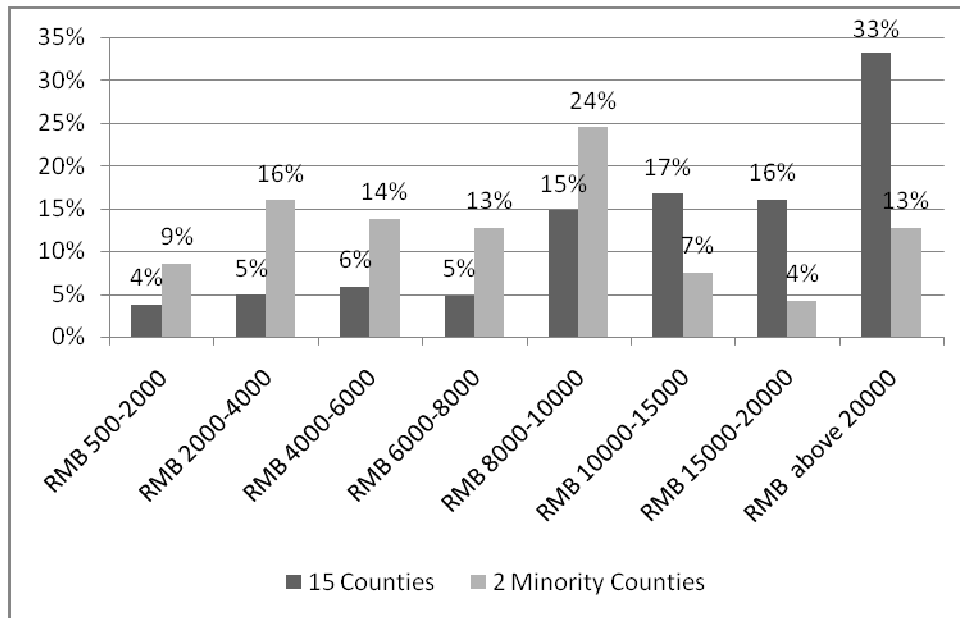
In summary, the findings from Hunan are suggestive for several reasons. First, the sample is not nationally representative. Second, Hunan is lower middle income and its inhabitants' living conditions are much better than arid, mountainous, or high altitude provinces in the western region. Its ethnic minorities are more integrated with Han society and many speak Mandarin, again different from ethnic minorities in the western region. Third, because this survey is the first of its kind, the instrument should be treated as work in progress. That said, the value of the survey lies in its highlighting of a number of policy issues that require attention, and in pointing directions for further research.

4.2. Descriptive statistics on household characteristics and habits

In the data analysis, sample means were calculated separately for the 15 non-minority counties and urban districts of the main sample and the 2 minority counties to avoid biasing the mean. To get familiar with the data before addressing the policy questions raised at the beginning of the chapter, this section presents descriptive statistics on household and child characteristics (see Annex 10 for sample mean and standard deviation of the variables analyzed for this study).

In the 15 counties, 33 percent of respondents have an annual household income above RMB20,000 (\$2,941), compared with only 13 percent in the two minority counties (see Figure 33). Also, only 4 percent of the respondents in the 15 counties has an income below RMB2000 (\$294), compared with 9 percent of respondents in the two minority counties. The two minority counties have the highest percentage of annual household income between RMB 8,000 and 10,000. However, these differences are magnified on a per capita basis since household size is larger in minority counties.

Figure 33: Annual Household Income in 15 counties and 2 minority counties



The average age of the children is 46.5 months old in the 15 counties and 47.1 in the minority counties (see Table 12). There are slightly fewer girls in the 15 counties than in 2 minority counties, probably due to the fact that ethnic minorities are allowed to have two to three children, thereby reducing the propensity for gender selection. In the 15 counties, 62 percent of the respondents are rural residents, compared with 99 percent in the two minority counties. In the 15 counties, 9 percent of children are minorities. In the 2 minority counties, 73 percent are minorities. About 69 percent of children in 15 counties attend nurseries or kindergartens, compared with only 25 percent in 2 minority counties.

Table 12: Sample Mean of Subgroup's Characteristics

	15 Counties	2 Minority Counties
Age (Months)	46.5	47.1
Boys (%)	52.5	50.3
Girls (%)	47.5	49.7
Rural (%)	62	99
Urban (%)	38	1
Han (%)	91	29
Ethnic Minorities (%)	9	73
Raised by parents (%)	68.5	52
Raised by other caregivers (Left behind children) (%)	31.5	48
Attend nursery/kindergarten (%)	68.5	24.5
Not attend nursery/kindergarten (%)	31.5	75.5

Left-behind children. In 15 counties, about 32 percent of the 3-year-olds are left-behind (not cared for by their mothers), compared with 48 percent in the two minority counties. In 2009, the mothers in the 15 counties stayed home on average for 8.6 months in a year and those in the 2 minority counties stayed home for only 6 months. The fathers spent even less time at home, averaging 7.6 months in 15 counties and 5.5 months in 2 minority counties.

Among the left-behind children, over 90 percent are cared for by their grandparents, mostly by the paternal grandmother, but also by the maternal grandmother and paternal grandfather. About 8 percent of the left-behind children are cared for by the father in the 15 counties, and 11 percent in the minority counties.

Economic burdens on grandparents of left-behind children. Grandparents bear much of the cost of raising their grandchildren. In 15 counties, 30 percent of the caregivers do not receive any payment from their children to cover the cost of taking care of their grandchildren; 45 percent receive less than RMB300 (\$44) per month, 18.5 percent receive between RMB300-600 (\$44-88) per month, and only 7.5 percent received more than that. In two minority counties, 32 percent of grandparents do not receive any payment and 58 percent receive less than RMB300 per month.

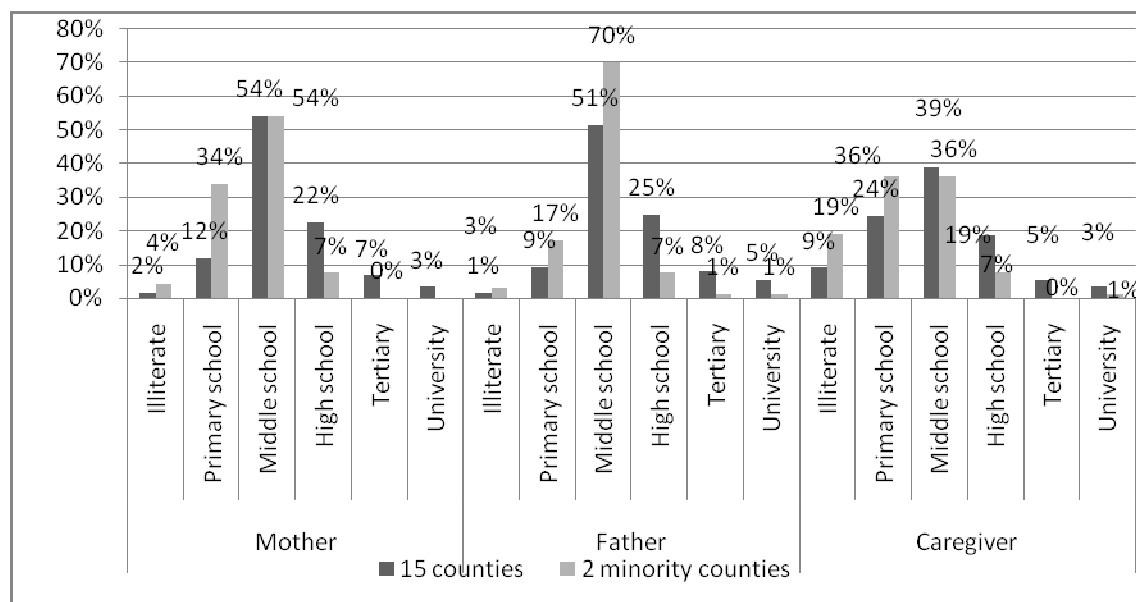
There is little difference in the percentage of respondents who own their home – 91 percent in the 15 counties and 93 percent in the 2 minority counties. Since most of them are rural households, this is not an indicator of wealth. For rural people, who essentially own their dwelling and rely on subsistence farming with some possibility of selling their produce in the market, having disposable resources is important in their decision to seek health and education services and buy books and toys that are stimulating to children. When primary caregivers do not have those available resources, they also are constrained in how they raise the children. Table 13 shows that 41 percent of rural residents and 43 percent of minorities did not buy a single book in 2009, compared with only 8 percent of urban residents and 28 percent of Han. There is also a lower percentage of minorities and rural residents who did not spend on toys.

Table 13: Caregivers' Investments in child development

		Han	Minorities	Urban	Rural
Bought books in 2009	None	28%	43%	8%	41%
	1-10	37%	38%	34%	39%
	>10	35%	19%	58%	20%
Spending on toys in 2009	None	13%	10%	4%	16%
	RMB 1-100	37%	50%	26%	45%
	>100	50%	40%	70%	39%

Educational attainment of parents and grandparents (nonparental caregivers). It is well established in the literature that the mother/caregivers' education level is closely associated with child development outcomes. In both the main and minority county samples, the educational attainment of mothers is lower than that of fathers, and that of caregivers is the lowest (see Figure 34). Furthermore, the educational attainment of parents and other caregivers in minority counties is lower than that in the 15 counties. About 4.3 percent of mothers in minority counties are illiterate compared with only 1.6 percent in the 15 counties, and 19 percent of caregivers in minority counties are illiterate, compared with only 9 percent in the 15 counties. None of the mothers in the two minority counties have any tertiary education, compared with 10 percent in the 15 counties. Roughly 54 percent of mothers in both samples have had junior secondary education (middle school), while 70 percent of fathers in the two minority counties have had junior secondary education. Yet, only 36 percent of caregivers in minority counties have had middle school education.

Figure 34: Educational Attainment of Mother, Father and Other Caregivers in 15 counties and 2 minority counties



Language spoken at home. In 15 counties, 11 percent speak Mandarin at home, 88 percent speak the local dialect, and 0.7 percent speak a minority language. However, in the 2 minority counties, only 4 percent of the primary caregivers speak Mandarin, 56 percent, the local dialect, and 40 percent, a minority language.

Sources of information on child development. Given the disadvantaged positions, the main equalizer appears to be information and communication technology. About 95 percent of households in the 15 counties and 92 percent in the 2 minority counties own a cell phone or a

landline. There is also a very high percentage of television (TV) ownership – 98 percent in the 15 counties and 97 percent in the 2 minority counties. For people who live in relatively isolated communities, ownership of means of telecommunication provides access to information. Table 14 shows that 47 percent of ethnic minorities reported to obtain information about early childhood education from TV, and about an equal number of rural residents said that same thing. The printed materials and friends and relatives are relatively less important as a source of information. Also, because television broadcast is in Mandarin, it has become a source for both the caregiver and the child to learn the official language, even if they only speak the local dialect or a minority language

Table 14: Channel through which caregivers obtain information about the importance of early childhood education

	Han	Minorities	Urban	Rural
TV	31%	47%	16%	43%
Printed materials	27%	18%	37%	20%
Internet	1%	3%	2%	1%
Friends and relatives	13%	3%	11%	13%
All of above	20%	15%	31%	12%
Not sure	7%	13%	2%	11%

Child rearing practices. There is surprisingly little difference between the 15 counties and the 2 minority counties in the reported time spent with children reading and playing, and hours spent watching TV (see Figure 35). There is also surprisingly little difference in the method of disciplining children between the two samples. About 80 percent said that they sometimes punish, while 56 to 60 percent said that they prefer to use encouragement (Figure 36). There is very little difference in the two samples in how respondents view gender equality. About an equal number of respondents in the 15 counties and the 2 minority counties believe that girls are equal to boys.

Figure 35: Percentage of Time on Reading, Playing and Watching TV in 15 Counties and 2 Minority Counties

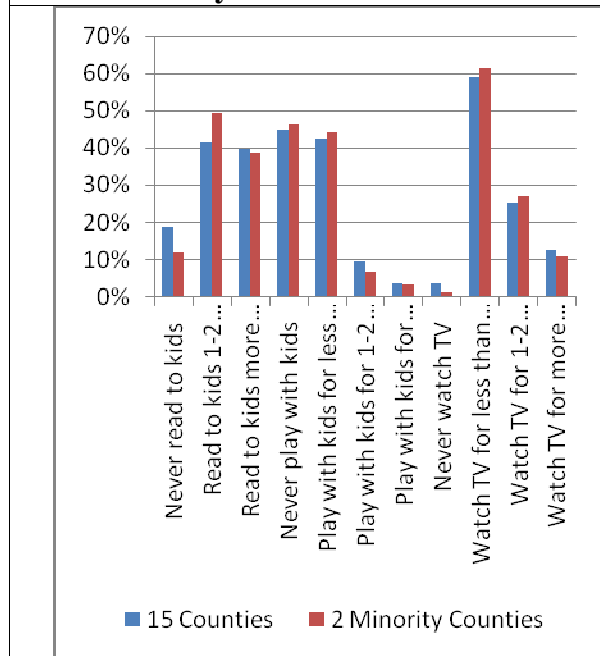
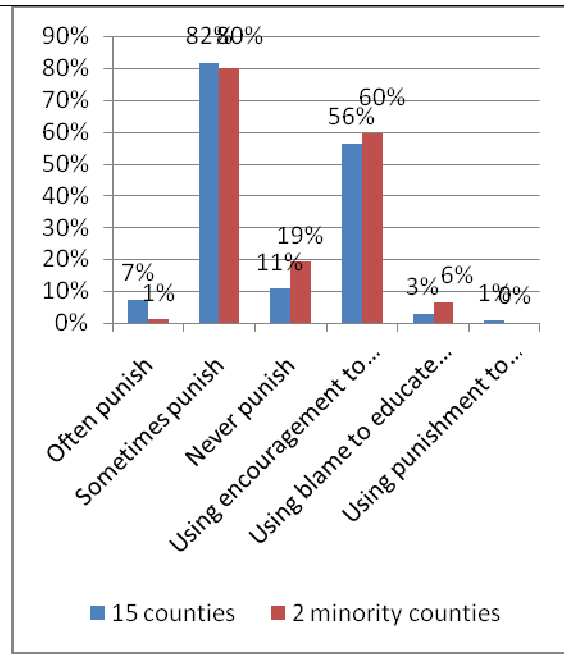
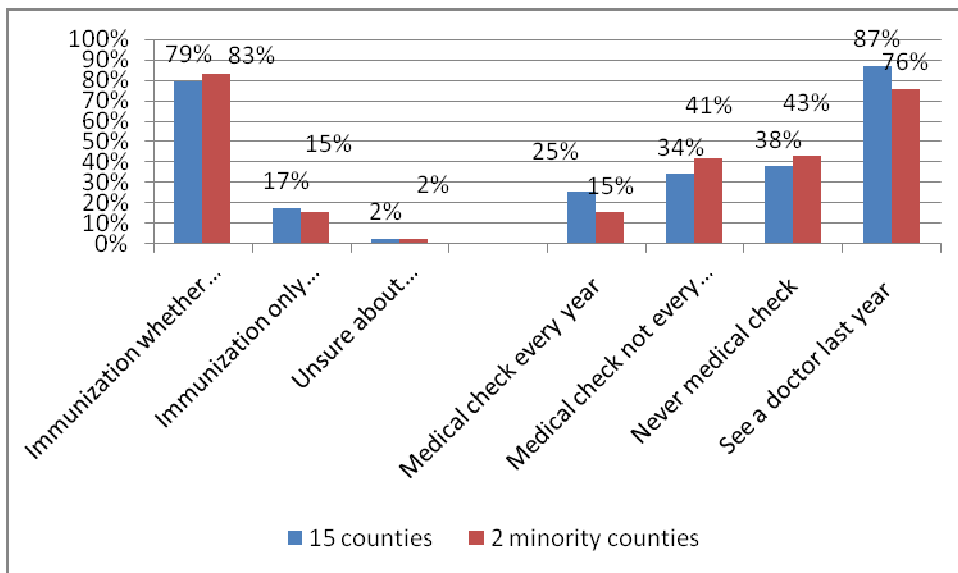


Figure 36: Method of Disciplining Children in 15 Counties and 2 Minority Counties



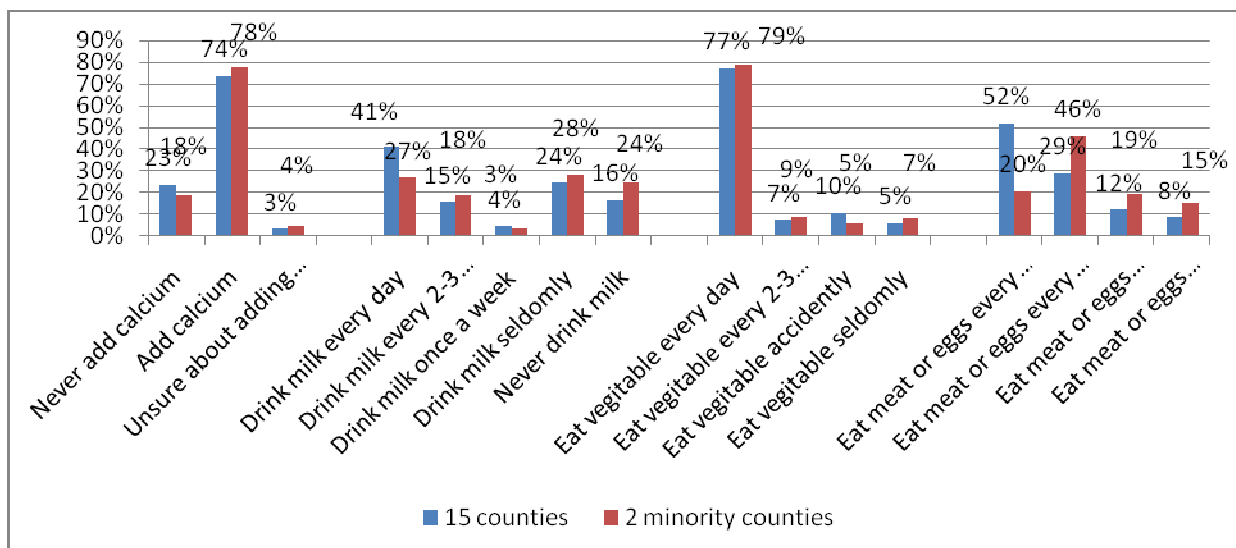
Immunization and health check-up. Respondents in both samples report similar coverage in immunization, but the frequency of medical check-ups varies considerably (see Figure 37). Children in the 15 counties are checked more frequently, and only 25 percent of children in the 15 counties and 15 percent in the two minority counties are checked every year. The vast majority of children are not checked every year. Children in the 15 counties have greater access to a doctor than those in minority counties.

Figure 37: Immunization and Medical Check-Ups



Dietary habits. Dietary differences are striking between the 15 counties and the 2 minority counties, especially the frequency of protein intake. About 41 percent of children in the 15 counties drink milk every day, compared with 27 percent in minority counties (see Figure 38). But almost an equal percentage of children in both counties consume calcium supplements. The vast majority of children eat vegetables every day. However, while 52 percent of children in the 15 counties eat meat or eggs (major source of protein) every day, only 20 percent of children in the 2 minority counties do so. About 15 percent of children in minority counties rarely eat meat, compared with only 8 percent of children in the 15 counties.

Figure 38: Frequency of Various Type of Food Intake



Smoking at home and in front of the child is common. In the 15 counties, 71 percent of households have someone smoking, 73 percent of caregivers smoke, and 81 percent of them smoke in front of the child. In the 2 minority counties, 79 percent of households have someone smoking, 55 percent of caregivers smoke, of whom 79 percent of them smoke in front of the child (see Table 15). This is in part due to the fact that Hunan is a tobacco producing province, and in part due to the lack of information about the detrimental effects of second hand smoking on health. Smoking is unlikely to have any immediate effect on child outcomes, but smoking at home is the more serious second-hand smoking and is known in the health community to have adverse effects later in life. For the long-term health of the country, controlling the use of tobacco is a key to improving health outcomes and to reducing health expenditure, as well as an effective way to address the challenges of an aging population.

Table 15: Smoking in the household in 15 Non-minority counties and 2 minority counties

variables	15 Non-minority counties			2 Minority counties		
	Mean	SD	N	Mean	SD	N
Having persons in Household smoking	0.70	0.46	800	0.79	0.41	94
No one smokes	0.30	0.46	800	0.22	0.41	94
1 person smokes	0.51	0.50	801	0.54	0.50	94
2 persons smoke	0.16	0.37	802	0.18	0.39	94
3 persons smoke	0.02	0.14	803	0.06	0.25	94
More than 3 persons smoke	0.00	0.05	804	0.00	0.00	94
Caregivers smoke	0.73	0.44	805	0.55	0.50	94
Smoke before child	0.81	0.39	806	0.79	0.41	94

4.3. Are there disparities in child development outcomes between subgroups?

Child development outcomes are measured by weight and height at survey, social development and cognitive development. Survey workers weighed the child, and measured the height. Social development was captured by 29 questions to the caregivers on how the child reacts and behaves in a variety of circumstances (for example, when meeting a stranger and relationship with other children). Every question has a five-point scale: never, almost never, sometimes, almost always, and always. Data analysis aligned the scale to ensure the higher score indicates better social development. Cognitive development was measured by administering a test directly to the child that has 50 items. The response is “yes” or “no” to indicate whether the child performed what he/she was asked. The higher the aggregate score, the better the cognitive development.

Table 16 presents the child development outcomes disaggregated by ethnicity in the 15 counties and 2 minority counties, respectively.

Table 16: Development Outcomes of 3-Year-Olds between Subgroups

	15 Non-minority counties				2 Minority counties			
Var	Mean	S.D	Mean	S.D	Mean	S.D	Mean	S.D
	Urban		Rural		Urban		Rural	
Weight at survey	16.03	2.47	15.77	3.29	14.00	NA	15.43	3.90
Height at survey	98.85	6.00	96.73	6.10	80.00	NA	94.62	7.82
Social development index	3.34	0.36	3.21	0.40	3.67	NA	3.24	0.43
Cognitive skills	0.68	0.21	0.48	0.22	0.59	NA	0.45	0.18
OBS	299	299	487	487	1	1	93	93
	Boys		Girls		Boys		Girls	
Weight at survey	16.00	2.51	15.72	3.49	16.12	4.33	14.64	3.21
Height at survey	98.11	5.85	96.89	6.41	96.10	8.16	92.69	7.32
Social development index	3.26	0.39	3.25	0.39	3.27	0.48	3.22	0.38
Cognitive skills	0.53	0.24	0.58	0.23	0.44	0.17	0.47	0.20
OBS	420	420	366	366	49	49	45	45
	Han		Minority		Han		Minority	
Weight at survey	15.92	3.07	15.30	2.22	16.06	3.99	15.18	3.85
Height at survey	97.87	5.79	93.96	8.36	94.12	5.53	94.59	8.65
Social development index	3.27	0.39	3.15	0.35	3.11	0.32	3.29	0.46
Cognitive skills	0.57	0.24	0.46	0.23	0.46	0.16	0.45	0.19
OBS	719	719	67	67	25	25	69	69
	Non Left-behind		Left-behind children		Non Left-behind		Left-behind	
Weight at survey	15.88	2.92	15.84	3.19	15.41	3.98	15.37	4.04
Height at survey	97.57	6.29	97.48	5.84	94.62	7.27	93.33	7.66

Social development index	3.28	0.40	3.22	0.37	3.28	0.37	3.22	0.50
Cognitive skills	0.59	0.24	0.50	0.22	0.50	0.20	0.39	0.13
OBS	529	529	257	257	37	37	45	45

	Attend kindergarten		Not attend kindergarten		Attend kindergarten		Not attend kindergarten	
Weight at survey	16.21	3.17	15.12	2.45	15.63	4.39	15.34	3.74
Height at survey	98.30	6.21	95.90	5.67	97.78	9.91	93.39	6.90
Social development index	3.30	0.39	3.16	0.39	3.47	0.44	3.17	0.41
Cognitive skills	0.63	0.22	0.40	0.19	0.54	0.22	0.42	0.16
OBS	537	537	249	249	23	23	71	71

Note: S.D. means standard deviation.

Urban children, Han, children cared for by their mother, and those who attend kindergartens are heavier, taller, and have better cognitive scores though not necessarily better social development scores, than rural children, ethnic minorities, left-behind children, and those who do not attend kindergartens. Although girls are shorter and lighter, they tend to have higher social and cognitive scores than boys in the 15 counties. On the whole, minority girls living in the 2 minority counties have the lowest weight and height than all other groups.

4.4. Do access to ECDE, medical care, and good parenting practices make a difference in child development outcomes?

To answer this question, we undertook multivariate analysis of the data in 15 counties of the main sample.⁴ We used weight, height, social development and cognitive development, separately as outcomes measures, because the determinants of these outcomes are different. For example, in physical development, there are fat children who are stunted because of malnutrition (from junk food) and the lack of exercise. A composite of weight and height would obscure the analysis. As regards social and cognitive development measures, combining them is also inappropriate because children could be normal or advanced in one aspect, but lag behind in the other.

We ran a number of regression models, to explore the relationship between independent variables and the dependent variables. The final models include those which are supported by theories on physical, cognitive and social development. The mean and the standard deviation of the independent variables used are presented in Annex 4. The regression results are presented in Annex 11.

(i) Regressing demographic characteristics on weight, height, social and cognitive scores

We began by regressing child age (number of months old), birth weight (from child health record), gender, family size, not cared for by parents (left-behind children), household income, rural resident status, ethnic minority, mother's education and primary caregiver's education on child development outcomes. These variables are associated with characteristics that come with family background and are not amendable to policy intervention. These predictors collectively explained 36 percent of the variance in height and weight, respectively, only 21 percent on social development, and 44 percent on cognitive development. The results are reported in Models (1) to (4) in Annex 11. The key findings are as follows:

- Weight at birth has a positive association with current weight and height, while girls and family size have negative associations with weight and height.

⁴ Due to the small size of the sample of the 2 minority counties, we could not run a separate regression for them. While it is theoretically possible to use the population as sample weight and pool the two samples together, due to the lack of population data in urban districts, we could not perform this function. For this reason, we restrict our analysis to only the main sample, which is representative of Hunan Province.

- Caregivers whose education is middle school and above are positively associated with height as well. Controlling for these characteristics, ethnic minorities actually have a very large, positive association with height. This means that, in spite of their shorter stature on average, this may be the consequence of nutrition, not genetics.
- Household income above RMB20,000 is positively associated with social development, while family size is negatively associated with it.
- Children who live in families with higher income, whose mothers have higher educational attainment, and whose primary caregivers also have higher educational attainment, are associated with higher cognitive skills.

(ii) Regressing enrollment in kindergarten, health checkup, and parenting practices on child outcomes, controlling for the demographic characteristics

We next added five groups of variables that are known in the literature to be good predictors of child outcomes – (a) whether or not the child attends kindergartens and/or parent-child classes; (b) frequency of health check-up; (c) parenting or child rearing practices (frequency of playing with the child, frequency of reading to the child, frequency of watching TV, and type of disciplinary actions taken); (d) dietary habits and nutrition (frequency of eating meat and eggs (source of protein), frequency of drinking milk (source of calcium), frequency of eating fruit and vegetable); and (e) caregivers’ access to child rearing information (which media is more effective in reaching caregivers). These variables are more likely to be amendable to policy interventions. The findings are summarized in Table 17. The regression results are presented in Models (5)-(8) in Annex 11.

- *Access to ECDE and health services.* As expected, attendance of kindergarten is positively and statistically significantly associated across the board with weight, height, cognitive and social development. Attendance in parent-child classes also has positive effects on cognitive development. Medical check-up every year is also associated with positive cognitive and social development.
- *Parenting practices* are important for social and cognitive development, and are likely to reinforce good practices in kindergartens: (a) the caregiver playing with the child for less than an hour a day, as opposed to not playing at all, has a statistically significant association with positive development; and (b) reading to the child for 1-2 times per week and more than two times per week, as opposed to not reading at all, are also positively related to cognitive outcomes. As a matter of fact, reading for more than two times per week raised the cognitive score by 0.132 of 2 point scale. This is very effective in improving child cognition. The recently released PISA data reaffirm the importance of reading to children. The difference in score points between 15-year-olds whose parents read to them weekly or daily and those who did not ranged from over 10 in Hong Kong-China, to over 60 in New Zealand. The difference between the 15-year-olds whose parents talked with them about what they did in school and those who did not ranged from over 10 score points in Hong Kong to nearly 50 in Qatar (Annex 14).

- *Children's access to stimulation by watching television.* Watching television, as compared with not watching, is positively associated with weight, height, social and cognitive development. This could be understood in the context of TV as a source of stimulation for children with songs, dance, cartoons, and teaching of some basic skills. In China, there are dedicated channels for children's programs in the China Central Television Station (CCTV), and in municipality and provincial stations, designed to stimulate, educate and entertain children of all ages. The beneficial effects of TV for this age group could be akin to the famous US children's program, Sesame Street, which evaluation found to help viewers learned more of the social and readiness skills when compared with control groups. (Bogatz and Ball, 1971). Annex 12 provides the content of children's program in CCTV5, Shanghai, and Hunan. (It should be noted that while this Hunan study found that children 0-3 obtain stimulation from TV, too much TV watching may not be good for older children because it could encourage passivity and may damage the eye-sight. Thus, it is important not to generalize to a broader population.)
- *Dietary habits and nutrition.* Drinking milk once a week, compared with no milk, has a positive effect on height. Eating meat or eggs every day, compared with rarely, has a positive association with weight. This is expected because of the calcium content in milk helps growth and protein in eggs or meat facilitates weight gain. That kindergarten attendance has a positive association with weight and height could be due to the fact that they provide meals and snacks that could compensate for the lack of certain nutrients at home.
- *Caregiver's access to information about child rearing practices.* Caregivers who obtain information from television, as compared with other sources, such as newspapers, magazines or words of mouth, are associated with positive child cognitive outcomes, after controlling for other effects. This suggests that parenting education can improve child development outcomes. This could be conveyed through television, or other organized activities.

The R-squared statistics increased, compared with the first four models. The new variables explained about 56 percent of the variance of cognitive scores, up from 44 percent in Model 4. Table 17 presents the summary of the effect size of the independent variables that have statistically significant association with child outcomes.

Table 17: Independent Variables that Have Statistically Significant Association with Child Outcomes

	Demographic characteristics without other predictors				Access to ECDE and health services, child rearing practices and dietary habits, controlling for demographics characteristics			
	Weight (1)	Height (2)	Social Scores (3)	Cognitive Scores (4)	Weight (5)	Height (6)	Social Scores (7)	Cognitive Scores (8)
Birth weight	+	+			+	+		
Female	-	-		+	-	-		+
Family size			-				-	
Household income (RMB) (compared with those below RMB 2000)								
2000-6000				+				+
15000-20000				+				+
>20000			+	+				
Minority		+				+		
Mother's education (compared with illiteracy)								
>3-year college				+				
Caregiver's education (compared with illiteracy)								
Primary				+				
Middle		+		+		+		+
High				+		+		
3-year college						+		
University				+				+
Attend kindergarten					+	+	+	+
Attend parent-child classes								+
Read to child (compared with no reading)								
>1 times week								+
>2 times/week								+
Play with child (compared with no play)								
<1 hour/week							+	
Obtain information of ECDE from TV (compared with from other sources)							+	+
Child Watch TV (compared with rarely)								
< 1 hour/day						+	+	+
1-2 hours/day						+	+	+
>2 hours/day						+	+	+
Medical check every year (compared with rarely)							+	+
Drink milk once/week (compared with not)						+		
Eat Meat or egg every day (compared with rarely)					+			
Constant	13.173	90.731	2.924	0.098	9.642	97.321	3.558	0.533
R-Squared	0.33	0.35	0.21	0.44	0.37	0.40	0.25	0.56
N	803	803	803	803	786	786	786	786

4.5. Policy implications

The Hunan data provided some good news. First, the fact that age in months, rural resident status, household income, and “left-behind” status have no statistically significant association with weight and height shows that Hunan children’s basic needs are met. However, it would be wrong to generalize to other poorer provinces. For example, in 2008, percentage of stunted children under-five was as high as 47 percent in Guangnan County in Yunnan, 42 percent in Jiangxi County in Guangxi, 24 percent in Menyuan County in Qinghai, and 23 percent in Anshun County in Guizhou, according to the Report of China Food and Nutrition Surveillance System (China Development Research Foundation, 2009). In these extremely poor counties, the determinants of weight and height would be very different.

It is worth noting that after adding the variables on access to services and parenting or child rearing practices in the multivariate analysis, household income, and mother’s education had no more effects on weight, height and social development, while caregiver’s education had reduced effects. As for cognitive development, household income of RMB6000-15000 had no more statistical significance when compared against those with income less than RMB 2,000. The effects of mother’s education also disappeared, and only caregiver’s education above middle school and with university education had statistical significance with cognitive development. This signals that the effects of mothers’ and caregivers’ education and household income are exerted through access to ECDE services and good child rearing practices.

In other words, providing these services and information to influence child rearing practices can alter the inherent inequity and improve physical, social and cognitive development. Also, given that birth weight consistently remain an important predictor of weight and height, ensuring proper nutrition at the pre-natal stage could help improve physical development. Also, the fact that birth weight affects all subsequent weight and height, there is a strong case for improving pre-natal care and nutrition for pregnant women in order to ensure better child outcomes after birth.

Chapter 5. The Way Forward

The previous chapters discuss the scale of the challenges of child development: Sixty-one percent of the 16 million babies born each year live in rural China. The prevalence of anemia at 6-months was 34 percent in rural China in 2008. Stunting among 2-year-olds was as high as 21 percent among poor rural counties in 2008. Roughly one-third of the 3-year-olds were left-behind by their migrant parents, and cared for by other caregivers, most often by their grandmothers. Non-parental caregivers have lower educational attainment and have less knowledge and information about nutrition, health, and education than the parents. Roughly one-third of rural children enroll in kindergartens and pre-school, of whom one-third were in one-year preschool only, not in 3-year kindergarten.

In light of the tremendous social benefits and high economic returns of ECDE in the form of higher future educational attainment and productivity, and lower probability of anti-social behavior, the cost of missed opportunity to provide ECDE to society is very high indeed. Also, given China's aging population, there is an urgency to improve the quality of human development to ensure higher productivity among the younger generation, so as to sustain the development of the country. China can only realize social harmony, political stability and economic prosperity if it can break the inter-generational transmission of poverty through provision of integrated ECDE services. For these reasons, it is imperative to expand ECDE services to all 0-6-year-olds, eventually, in the long run.

However, it is necessary to distinguish the strategies for the medium-term (2011-2015) from those for the long-term (2016-2020) because public resources and the capacity to deliver are still constrained. The medium-term coincides with the 12th Five-Year Plan (FYP) and the long-term, with the 13th FYP. What could be accomplished in the 12th FYP will influence what is possible in the 13th FYP. For this reason, this chapter will focus on discussion on the coming FYP.

There are two policies which could be pursued simultaneously. The first is to provide targeted interventions to specially disadvantaged groups through the government's anti-poverty programs with ear-marked funds from the central government. The second one is to expand the provision of ECDE services in rural areas through the regular budgetary process under line ministries and their counterparts in provincial and local governments, supported by central fiscal transfer in Western and Central Regions. In both options, there is a need to distinguish the services for the 0-3 age-group from those for the 3-6 age-group because their developmental needs are different.

5.1. ECDE as part of the Government's Anti-Poverty Program

To realize China's development objectives, top priority must be given to the extremely poor children in order to change the trajectory of their lives. In 2008, there were 35.97 million extremely poor people, earning less than RMB1,196 (\$176) per year per capita, far below the World Bank's definition of extreme poverty in the world which is \$1.25 a day. These extremely

poor people have large family: 67 percent of them have five or more family members, higher than the national average. Of this group, about 18 percent (6.5 million) are children under 12 years of age. Since children are covered by free compulsory education after reaching 6 or 7 years of age, children from 0-6 should be the prime beneficiaries of the ECDE services. In other words, there are about 3 to 4 million children living in extreme poverty that need assistance.

Geographic targeting is possible because 66 percent of the extremely poor live in the Western Region, 25 percent in the Central Region, 5 percent in the Eastern Region, and 3.2 percent in the Northeastern Region (National Bureau of Statistics, 2009). Provinces in the western and central areas performed far worse in terms of maternal mortality, percentage of babies born with low-birth weight, under-5 mortality, and student-to-staff ratios in ECDE centers. The geographic distribution of the extremely poor overlaps with their distribution by terrain: 52 percent of them live in mountainous or remote areas, 22 percent in hilly areas, and 25 percent on the plain. Ethnic minorities tend to live in mountainous or remote areas, and have an incidence of poverty of 11 percent more than twice the national average. Their children should be major beneficiaries of the targeted interventions.

Currently, the Government targets 592 poor counties out of a national total of some 2,800 counties for special assistance. The activities include: (a) improvement of means of production (agriculture, forestry, live stock raising, processing of agricultural products); (b) infrastructure improvement (land, drinking water for human and animals, roads, electricity, telecommunication, schools, and health clinics); and (c) training and education. In 2008, of the RMB36.7 billion (\$5.4 billion) allocated for poverty reduction, 45 percent was spent on improvement of the means of production, 32 percent on infrastructure improvement, but only 1.8 percent on social services, including education and training. However, the Anti-Poverty Program has yet to include ECDE services for extremely poor children 0-6.

This report advocates that subsidized ECDE services be added to the Government's Anti-Poverty Program. The two sections below described what interventions are needed for the 0-3 and 3-6 age groups and what service delivery mechanisms can be cost-effective in light of international experience.

5.1.1. Interventions for the 0-3 age-group

Services to this age group includes “care” to meet their physical and emotional needs, and “parenting” to shape their cognitive and socio-emotional skills and behavior. Children under two years of age are the most vulnerable to lack of adequate care. In particular, a large proportion of child death occurs during the neonatal period (i.e., the first 28 days). Stunting typically occurs in the first 2 years of life and is difficult to reverse after 36 months. This period is also very crucial for brain development. Severe lack of stimulation and human interaction can have devastating and harmful effects on the biology and psychology of the young brain.

The determinants of healthy development of 0-3-year-olds are adequate nutrition (including breast-feeding and complementary feeding), management of various childhood illnesses (such as diarrhea), health and hygiene practices, quality of interaction between the mother/caregiver and the child, immunization, sensory motor and language stimulation and

opportunities for play and exploration. The desirable outcomes are freedom from intermittent diseases, nutritional security, curiosity, sociability, and confidence that comes from appropriate self-help, and development of sensory motor skills and language skills. The indicators are full immunization against major diseases, completion of all prophylaxis by the end of age 3, appropriate height & weight for age, and age-appropriate gross and fine motor skills & auditory visual skills, toilet trained, ability to communicate clearly and confidently, sociability and ability to stay away from family for a few hours (see Annex 3 for the conceptual framework of child development from 0-6).

The objectives of services for this age-group should be: (a) to improve prenatal care, nutrition and information for pregnant women in order to strengthen the probability of delivering a healthy baby and to ensure delivery in a hospital; (b) to improve nutrition of infant and toddlers between 6 and 24 months old (by providing protein, iron, calcium, zinc, Vitamin Bs and Vitamin D3) to ensure optimal physical and cognitive development; (c) to improve the knowledge of mother and primary caregivers about child care and good child rearing practices that facilitate desirable development; and (d) to foster the formation of network of caregivers in local communities to share experience, and to create opportunities for children to interact with their peers.

A compelling case for nutrition and health interventions has been made by the evidence from Hunan which shows the predictive power of birth weight on weight and height at 3 years of age, and from China's Center for Disease Prevention and Control's pilot study on the effects of nutritional interventions on physical and cognitive growth (see Box 5). The intervention for the extremely poor people should include the following: (a) multi-nutrient supplement for women during pregnancy; (b) subsidies for transportation for poor women to have routine health check up; exemption of user fees for delivery in hospital for extremely poor mothers; (c) provision of free nutritional dense food package for the 6-to-24 month-olds; (d) free routine health care and immunization for the 0-6 age group; (e) prenatal and post-natal mother's class to enhance mothers' knowledge and skills in complementary food preparation, feeding practice, and parenting techniques.

Given that 90 percent of the 0-2-year-olds in China are raised at home, parenting education is absolutely critical to improve child development outcomes. Parenting education can be done for the mother, the father, or other caregivers such as grandparents. It typically provides the techniques of human interaction needed for emotional, social and cognitive development. It also provides counselling to address specific issues at home. Parenting training usually encourages the caregiver to play with children, read to them and teach them basic concepts such as numbers, shapes and colors. It also encourages the caregiver to take children to play groups and to create opportunities for peer interactions which are essential to develop social and language skills.

Box 5: Strategy on Nutritional Security Recommended by Chinese Center for Disease Prevention and Control (CDC)

The CDC piloted a study in five poor counties with 1,500 children and a control group. The intervention is very simple –children aged 6-12 months in the treatment group were given a nutritional sachet per day until they were 24 months old. The formula of the nutrition package includes 10 grams of whole soybean powder, fortified with micronutrients: 6 mg of iron, 4.1 mg of zinc, 385 mg of calcium, 0.2 mg of vitamin B2, 280IU of Vitamin D3. Compared with a control group at 24 months, the treatment group's anemia prevalence was reduced by 45 percent, the height was increased by 1.3 cm, the development quotient (DQ) score was 1.7 -3.4 points significantly higher. A follow-up study found that the differences in intelligence score was sustained up to the age of 6, with the experiment group having 3.1-4.5 DQ score higher than the control group.

The CDC advocates for the introduction of complementary feeding for children in poverty, to set up a national food fortification program and scale up effective fortified food products for children under 2 and pregnant women, and the establishment of an indicator system for nutrition security (such as percentage of stunting and anemia of children aged 3, percentage of anemia of pregnant women) into the social and economic development plan and poverty alleviation plan, and integration of several indicators into the national statistical report.

Source: presentation by Professor Chunming Chen, Chinese CDC at the International Symposium on Anti-Poverty and Early Childhood Development, October 29-30, 2009, Beijing, China.

Service delivery mechanisms. A home-based and community-based approach that facilitates interaction and training of mothers and caregivers by persons knowledgeable about nutrition, health, and stimulation can be highly cost-effective. The Ministry of Civil Affairs' (MOCA) Social Assistance Department is considering introducing a child-focused component into the minimum guarantee scheme (dibao) of possibly conditional cash transfer. MOCA's Social Welfare Department will be piloting community-based delivery of comprehensive child welfare service package. MOCA is also considering increasing the training of social workers to support community-based service delivery. Separately, the State Council's Leading Group on Poverty is considering piloting community-based services for children in poverty.

International experience shows that these mechanisms are affordable, cost-effective and sustainable. The cost of a home visiting program at US\$ 312 per child per year in Jamaica. Other home based programs yield a range of annual unit costs from \$90 in Morocco, to \$113 in Mexico (World Bank, 2010).

Below are some examples of community or home based programs in other countries:

- Nepal, a low-income and mountainous country, facilitated discussions among women in villages on various issues around childbirth and child care. These groups formulated and implemented strategies to generate community funds for maternal and infant care, and organize home visits by a group member to newly pregnant women.

In the process, the program participants sought and received information regarding maternal and child health and care. The impact evaluation of the program found lower neonatal death rate, better uptake of prenatal and delivery services, and improved home care practices in the program communities than in the control communities. Similar results were found in the trial of this approach in the Warimi Project in Bolivia.

- Jamaica has a home-based program that uses stimulation to mitigate the effects of stunting. Jamaica provided to 9-24 month-old stunted children nutritional supplements of 1 kilogram of milk-based formula per week and stimulation through 1-hour weekly home visits by community health workers to improve mother-child interactions through play. After two years of intervention, the development quotient (DQ) gap between stunted and non-stunted children was narrowed. A follow-up study of these children at ages 7-8, 11-12, and 17-18 found that children receiving stimulation improved cognitive and educational performance over time. Among children who received the nutritional supplement but not the stimulation, the positive cognitive effects ceased to be evident at ages 11 and 17 (Grantham McGregor, S.M., Walker, S.P., Chang, S.M. & Powell, C.A., 1997).
- Vietnam also has a home-based program to provide nutrition to 0-3 year-olds and a stimulation intervention for the 4-5-year-olds. Evaluation found improved cognitive outcomes when compared to children who only received the nutrition intervention.
- Brazil's "Complete Early Childhood Program" offers childcare on Saturdays, coupled with parent training in health and education. These training classes use videos and discussion to cover a range of areas from specific health interventions (How to treat infant diarrhea?) to stimulating playtime (The world of make-believe!).
- Mexico's preschool expansion policy included a mandate for all parents to send their 3-, 4-, and 5-years-olds to preschool. The target was for 100 percent coverage of 5-year-olds in 2004, 4-year-olds in 2005, and 3-year-olds in 2008. In 2005, coverage reached 98 percent of 5-year-olds, 81 percent of 4-year-olds, and 25 percent of 3-year-olds. Mexico further expanded downward to provide low-cost but high quality parenting education for all children from 0-4. Box 6 provides the details of the program.

Box 6: Mexico's Parenting Education to Equalize Opportunities for the Poorest 0-4 Age Group

Mexico's *Consejo Nacional para el Fomento Educativo* (CONAFE) has developed a low-cost quality model to reach 8 million 0-4-year-olds. The model uses existing infrastructure such as preschools and public spaces for meeting areas to enable a network of volunteers to teach parenting education classes in target communities. The parenting training aims to improve children's competencies and school readiness. Preliminary evidence reports that 80 percent of teachers and 76 percent of school directors find greater parental attention and support provided by parents who had participated in CONAFE's program, and that 86.6 percent of parents reported that their children had made an easier-than-expected transition to preschool as a direct result of the program. The cost is \$112 per child per year, thereby allowing the government to serve large numbers of their target group in a sustainable manner.

Training sessions and activities for parents and caregivers, their young children and pregnant women aim to strengthen family understanding of early childhood development, and demonstrate how the family can best stimulate the process. Each parent education session follows a didactic approach consisting of four phases: reflection, sharing ideas, practice, and closing and is supported by program materials provided by CONAFE. Evaluations are integrated into the program cycle at the beginning (3 sessions), periodically during the course of the year (4 sessions), and at the conclusion (1 session). A trained promoter provides 18 weekly two-hour sessions to families with children aged 0-4 years, eight monthly two-hour sessions to mothers, and eight monthly two-hour sessions to expectant mothers, during nine-month yearly cycles.

The program offers two innovations: (i) more early stimulation activities working directly with children (together with their parents), and (ii) parenting education directed explicitly toward fathers. The Project supports 18 weekly two-hour early stimulation sessions for children under 2 years old accompanied by their parents and five special two-hour sessions aimed at fathers. These sessions promote father's participation in childrearing. Education furthers creates a space for them to share and learn amongst their peers.

Source: Holland, Peter and David Evans (2010). "Early Childhood Development Operations in LCR: Jamaica, Mexico, and Brazil in Focus" World Bank, February 2010, Number 152. (<http://www.worldbank.org/enbreve>).

5.1.2. Interventions for the 3-6 age group

Children at ages 3 to 6 are interested in learning. Interventions should focus on formation of good habits and on improving their school readiness skills – which include language, numeracy, and psychosocial skills. Good outcomes include activeness, self-confidence, good fine and motor skills, awareness of the environment, freedom from intermittent diseases, and nutritional security. If there is disability, there should be appropriate management of it. The determinant are quality ECDE, basic healthcare services, including disability screening, nutritional adequacy and incidence of intermittent diseases, and literacy level of parents, and educational environment at home. Indicators are active participation in ECCE activities, ability to narrate experience confidently, demonstration of curiosity, age-appropriate self-help and social skills, age-appropriate height and weight, and regular pre-school attendance.

Service delivery mechanism. A formal system of kindergarten under MOE is in place for this age group. However, rural children, particularly extremely poor children living in remote areas, are under-served. Given the high cost of center-based ECDE services such as parent-child classes and formal kindergartens, local governments are unlikely to have sufficient revenue to fund center-based ECDE services in rural areas for the 3-6 age group. The financial constraints of local government limit supply and parental inability to pay dampens demand.

Expansion of ECDE services does not mean to replicate the formal model of provision, however. Services can be provided in a flexible manner. The formal kindergarten provides up to 8-10 hours of services per day or 40-60 hours per week, including daily breakfast, snacks, lunch and a two-hour afternoon nap. Reducing the time of services could reduce cost as more children can be accommodated in two shifts in the same facilities, and perhaps even taught by the same teachers. A review of international literature found that most children could have cognitive gains by participating in center-based ECD programs for 15 to 30 hours a week (i.e., 3 to 6 hours a day), during at least nine month of the year, and that children from lower-income families could benefit even more from more intensive programs.

Alternative modes of delivery could also use parenting education to deliver curriculum-based information at home. Below are some examples. Table 18 also presents in a more concise form some international experience on curriculum-based parenting education.

- A British large scale longitudinal study of home activities found that children being read to, playing with numbers, painting and drawing, being taught letters and numbers had significantly positive effects on the level of literacy and numeracy at age 5.
- Studies in the USA also found learning opportunities provided by the home, for example, frequently being read stories and visiting a library or museum, are positively associated with school readiness.
- The Turkish Early Enrichment Project provided a two-year parenting information program to the mothers of 3-5-year-olds. Some of these children attended a pre-school, some were in a custodial day care center, and some stayed home. There were biweekly home visits and biweekly group meetings on alternate weeks to provide training and support. Using a curriculum based on the HIPPY (Home Instruction Program for Preschool Youngsters) program, the mothers were supplied with learning materials weekly and instruction on how to use the materials with their children. The group meetings consisted of guided discussions on various topics such as nutrition, child health, play activities, discipline, and child-parent communication. The earlier advantage of children in educational preschools who had a higher baseline IQ and cognitive and social-emotional measures than those in custodial day care or home care, dissipated by the fifth year of primary school. On the other hand, irrespective of attendance to center-based care, the effects of the parenting information program on children's school

achievement and socio-emotional development and social adjustments were sustained throughout childhood.

Table 18: Promising Curriculum-based Parenting Education Programs

	Goals	Entry and Exit	Main inputs
DARE to be you	Improve parenting skills and child development in ways that contribute to children's resiliency to substance use later in life	Entry and exit: 2 to 5 years	Parent-child workshops with focus on parenting skills and developmentally appropriate children's activities. (15 to 18 hours of parent training workshops and simultaneous children's programs, preferably in 10–12 week period.)
HIPPY (Home Instruction Program for Preschool Youngsters)	Help parents with limited education prepare their children for school entry	Entry: 3 to 4 years Exit: 5 years	Parenting classes and books given to parents with activities to do with children; home visits Parents meet with paraprofessionals biweekly for 45–60 minutes; parents meet with children using HIPPY materials at least 15 minutes daily; parents have group meetings biweekly; 30 weeks per year for two years
Incredible Years	Promote child social and emotional competence and address children's behavioral and emotional problems	Entry and exit: 2 to 8 years	Parenting classes and children's programs (Parents: 12–14 weeks, 2 hours per week; children: 18–20 weeks, 2 hours per week)
Parents as Teachers	Empower parents to give their children a good start in life, prepare children for school entry, and prevent and reduce child abuse	Entry: prenatal or child less than 8 months Exit: 3 to 6 years	Home visits by parent educators; group meetings with parents; developmental health, vision, and hearing screening; and building networks to meet family needs (Weekly to monthly home visits/group meetings, 60 to 90 minutes)

Source: Naudeau et al, 2010.

The emerging evidence of the cost-effectiveness of ECDE in breaking the inter-generational transmission of poverty has given impetus to an increasing number of countries in providing services to the poor. Latin America as a region is particularly advanced in experimentation with instruments to offer services. Box 7 provides an overview of the findings from impact evaluation of these services.

Box 7: Experience of ECDE in Latin America

Middle-income Latin America and the Caribbean (LAC) Region uses ECDE to achieve the following objectives: (i) enhancing cognitive and socioemotional development, physical growth, and well-being; (ii) enhancing a mother's antenatal care with services and information to strengthen the probability of delivery of a healthy baby; and (iii) education of parents and/or caregivers in better parenting, health, and hygiene practices, and to provide them the opportunity to work. ECD programs in LAC thus affect 0-6-year-olds, their mothers, their caregivers, daycare centers, preschools, health centers, and communities. Impact evaluation has the following findings:

- Conditional cash transfer (CCT) programs in Mexico have large positive effects on the physical development of young children, Chile's program improves the probability of young children attending preschool, and Nicaragua's program reduces developmental delays.
- Parenting programs in Jamaica, Bolivia, Honduras, and Nicaragua are effective in helping parents improve their childrearing and child stimulation techniques, resulting in children with improved development of cognitive, language, motor, social, and other skills.
- Early education and preschool programs in Argentina and Uruguay show that children's language and math test scores, behavioral skills, as well as their long-term educational attainments, benefit from preschool attendance.
- Nutrition and supplementation programs targeted to low-income children, such as Mexico's subsidized milk programs for children and pregnant and lactating women, Colombia and Guatemala's nutrition and early child care programs, and CCT programs in Mexico and Colombia, are found to improve cognitive outcomes, and physical well being of children. Interventions that offer nutrition supplements, together with those that combine several strategies (e.g., parenting practices, early childhood care, and nutrition) have positive effects on children's acquisition of language, reasoning, vocabulary, and schooling.
- Programs that condition cash payment on children's attendance at health centers and periodic physical monitoring, such as Mexico, Colombia, and Honduras's CCT, have beneficial impact on health. Ecuador's unconditional cash transfer programs appears to have positive effects on the development of children's motor skills and other developmental indicators, mainly due to better household nutrition and deworming medications.

Source: The Promised of Early Childhood Development in Latin America and the Caribbean by Vegas and Santibañez (2010)

5.2. ECDE as a Mainstream Service

A policy framework. ECDE interventions that are successful in reducing income and social gaps between poor and non-poor populations are multi-sectoral in nature, including health, nutrition, education, water, hygiene, sanitation, environmental protection, and legal protection. To make ECDE a mainstream service, there is a need to set up a policy framework to provide the vision and the targets. Different policy areas that affect young children should be linked together and coordinated efforts can be made across a multiple line ministries and their local counterparts towards a common set of outcomes. In China, the responsibilities for the 0-3 age group are most diffused, and the need for a policy framework is also more acute.

International experience suggests that a national ECD policy would include the following elements: (i) defining an institutional anchor and achieving intersectoral coordination; (ii) ensuring adequate funding (e.g., by creating a dedicated national fund, using existing social funds or budgets, or instituting fee-sharing schemes or earmarked taxes); (iii) defining core priorities, such as whether policies will be targeted or universal, which populations take priority, and what proportion of funds will be allocated to ECD activities; (iv) building on the success of existing interventions, based on rigorous evaluations and cost accounting; and (v) ensuring coherence with other related policies from inception. There should also be a set of monitoring indicators to measure progress towards the goal and provide the foundation for an accountability mechanism.

Funding mechanism. *MOE's National Plan for Medium- and Long-term Education Reform and Development* aims to universalize one year of pre-school first and advocate for expansion of services in localities which could afford to do so. Barring major changes, the decentralized financing structure is likely to perpetuate the existing inequity. Thus, central fiscal transfer along the model of that in compulsory education is needed to expand services in the rural areas, particularly to western and central provinces where the needs are also the greatest. Having a policy framework would be important to guide the allocation of funds and activities.

In general rural areas which are not extremely poor, where women have general access to hospital for delivery, and children are not particularly malnourished, it would seem that parenting education for the mother and other caregivers would be most important because the quality of their daily interaction would affect child development the most. Parenting education would also need to address some common practices which are detrimental to child development. A prime example is the effects of smoking in the presence of the child on their future health. Parenting education would be important even if children are attending kindergartens because complementary quality inputs would be far more effective. Given the importance of the television in dissemination of information on child rearing practices, the TV could be used more effectively in conveying parenting information. The marginal cost is likely to be low.

On the issue of finance, it is useful to look at OECD's policy that are pro-poor and pro-families and children. Table 19 shows that almost all OECD countries have some form of subsidies or another for low-income families to enable them to access ECDE services.

Table 19: OECD Countries' Policy towards the 3-6 Age Group

	Partial subsidies of tuition fees	Subsidies for Low income, multiple children families	Partial exemption from fees	Some childcare centers provide partial exemption of fees
Australia	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Belgium	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
Canada	<input type="checkbox"/>			<input type="checkbox"/>
Denmark	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Finland	<input type="checkbox"/>			<input type="checkbox"/>
France			<input type="checkbox"/>	<input type="checkbox"/>
Italy				<input type="checkbox"/>
Luxembourg			<input type="checkbox"/>	<input type="checkbox"/>
Holland	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Norway	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>
Portugal		<input type="checkbox"/>	<input type="checkbox"/>	
Sweden			<input type="checkbox"/>	<input type="checkbox"/>
UK	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USA		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
South Korea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Source: Liu, 2009.

It would also be useful to review two countries' experience on ECDE – Cuba and Sweden. In spite of the diversities of these two countries' conditions, their political systems and country-income levels, both have done a good job in providing services for children. Box 8 presents their experience. Given China has a fairly high labor force participation rate of women, a more pro-family policy is likely to release the ingenuity and efforts of half of the workforce.

Box 8: Equity and Child Development in Cuba and Sweden

Cuba, in contrast with all other Latin America countries, has attained a high level of literacy—in a population that has very low income. Children in Cuba have the highest test scores for 3rd-grade achievement in language and math, among all Latin American and Caribbean countries. Although preschool is not compulsory in Cuba, it is an initial link and part of a nationwide system of education. Comprehensive programs target children ages 0–5, enrolling approximately 98 percent of this age group. Services include formal daycare centers as well as non-formal programs. Parents’ participation is engaged through the message “Educate Your Child”—which begins within families and communities and subsequently links to enrollment of 5- to 6-year-old children in preschool preparatory programs. The attention given to children in Cuba begins *before* birth, at pregnancy. In each neighborhood, pregnant women receive a special allocation of milk and staple foods, and parenting programs are available for mothers and families. As soon as children are born and until they enter primary school, they benefit from an array of childcare and ECD services. All of the services involve parents and communities (the non-formal sector) and health and education institutions (the formal sector). Moreover, the services are intergenerational—for example, a literacy program for parents is linked with development strategies for their children.

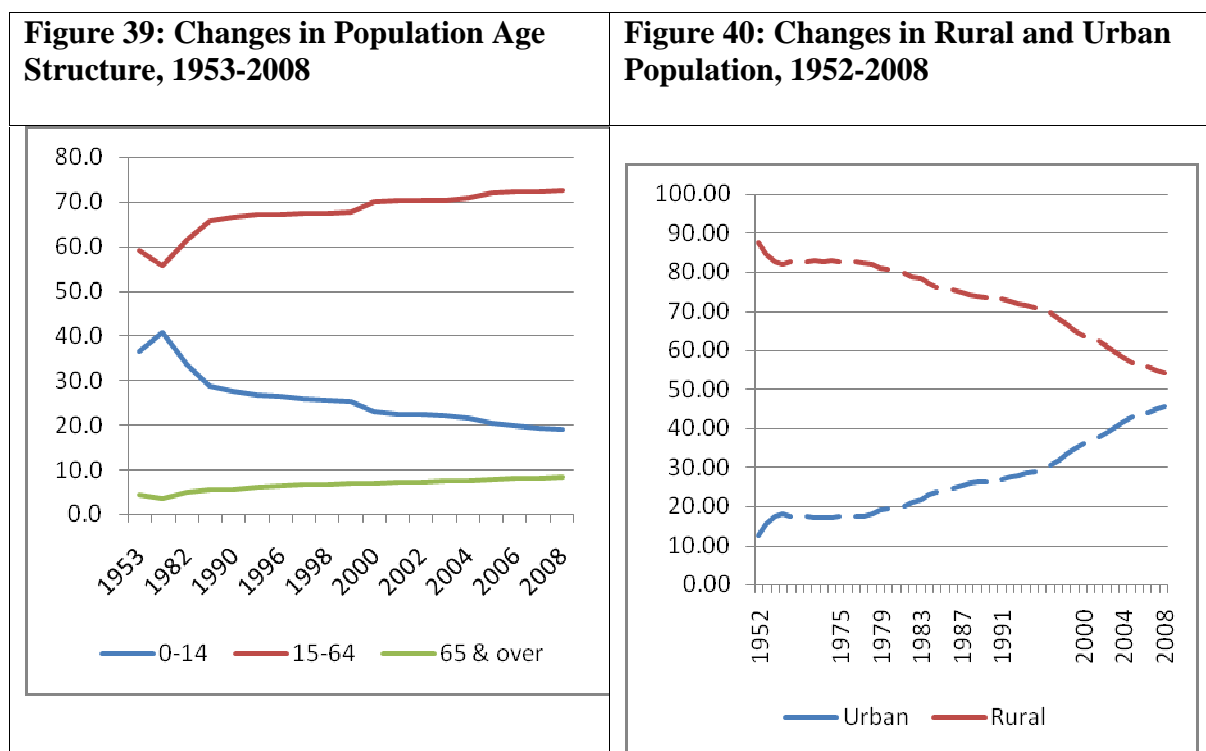
Sweden provides a continuum of services from birth to age 6. Two percent of the gross domestic product of Sweden goes to expenditures for family welfare, including children ages 0–6 years. The expenditures are for parents’ insurance and for care and education in the preschool system beginning at age 1. Preschool education is voluntary, yet 95 percent of children under age 6 participate. The preschool system aims to encourage children’s learning and to provide a safe environment for children of parents who work or study. Its overall goal is “educare.” The curriculum focuses on the meaning of facts (not facts per se), thematic learning (rather than subject learning), and play-based activities related to the learning process. The Government of Sweden sets guidelines and regulations for the preschool system, and the country’s 290 municipalities finance and provide services. Preschool is integrated into the entire school system as the first level of education. Quality is maintained through governance. That is, Sweden’s legal and regulatory framework for preschool services ensures a fair and sustained investment in these services, and substantive research serves as the foundation for curriculum and professional development.

Source: Young, 2009.

5.3. Conclusion

China’s demographic trend is highly favorable for investment in ECDE because of the relative small size of the age group and low child dependency ratio (Figure 39). The 0-14 age group declined from the height of 41 percent of total population in 1964 to 19 percent in 2008, making it more feasible and affordable to provide high quality care, development and education

to children. Furthermore, the trend of increasing urbanization also makes it easier to provide ECDE service than before (Figure 40).



Source: Statistical Year book of Population and Labor, 2009

Yet it is also true that the roll out of many important social programs, such as health insurance, pension, and free compulsory education, is putting enormous burden on county finance. The report advocates for additional central fiscal transfer to western and central areas to support local governments in the provision of cost-effective, community- and home-based ECDE services, instead of expensive kindergartens.

During the 12th Five Year Plan period (2011-2015), China could consider using doing pilots under the Government's Anti-Poverty Program, with the aim to strengthen the capacity of rural and ethnic minority communities to provide integrated nutritional, health and early stimulation/education services. These pilots should test the type of interventions needed to replicable and scaled up to a broader areas, and in other types of terrain and geographic locations. The Central and Provincial Governments can play a role in providing financial and technical support to these communities.

In the medium term (12th FYP), public investments in ECDE should be targeted to children at risk --children in remote areas, ethnic minorities and left behind babies and toddlers -- the goal should aim at universal coverage in the long-term. For China to move to a high-income economy, there is a need to improve the quality of human development in order to sustain the social and economic development.

By improving the quality of human development, ECDE also simultaneously improves the future citizens' productivity and competitiveness, thereby enabling China to overcome the challenges of an aging population and transition into a high income economy.

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Annexes

Annex 1: Key Educational Indicators in Comparative Perspective, 2009

		China	High income Economies	Middle Income Economies	East Asia & Pacific
Education Inputs	% of public education expenditure to GDP	3.5	5.8 (OECD)	4.3	3.5
	Primary school pupil-teacher ratio	18	14	24	20
Gross Enrollment Ratio	Preprimary	51	78	44	42
	Primary	106	101	111	106
	Secondary	99(Jr. secondary) 79 (sr. secondary & TVET)	-	70	73
	Tertiary	24	67	24	21
Education Outcome	Adult literacy rate	96(M) 90(F)	99(M) 99 (F)	9 0(M) 8 0(F)	9 6(M) 90(F)

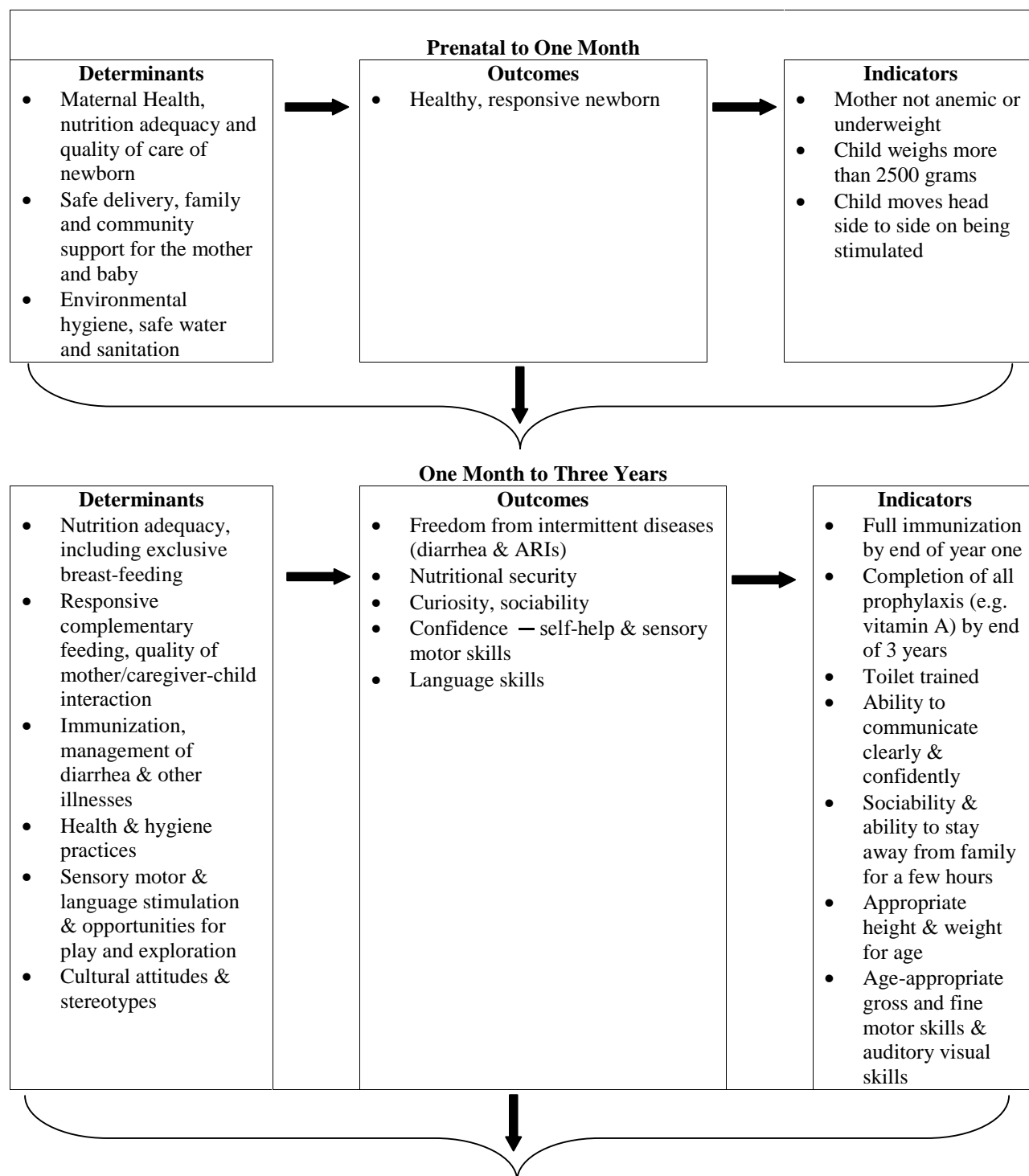
Source: World Bank, 2009. World Development Indicators; MOE, 2010. *National Plan Outlines for Medium and Long Term Education Reform and Development 2010-2020*.

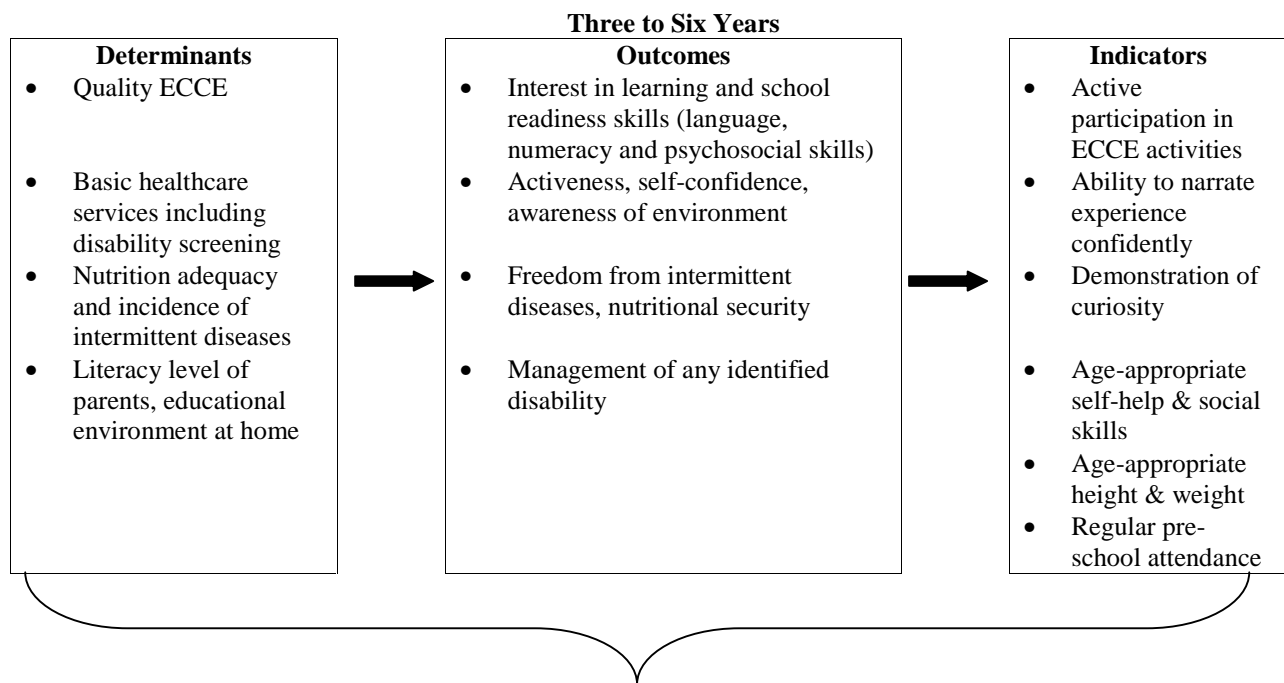
Annex 2: Gross Enrollment Ratio (GER) by Subsector in 2009 and Targets for 2015 and 2020

Targets	Unit	2009	2015	2020
Pre-primary Education				
Enrollment	Million persons	26.58	34.00	40.00
GER 1 year before primary	%	74.0	85.0	95.0
GER 2 years before primary	%	65.0	70.0	80.0
GER 3 years before primary	%	50.9	60.0	70.0
Nine Years of Compulsory Education (Primary and Junior Secondary)	Million persons			
Enrollment	%	157.72	161.00	165.00
Retention Rates		90.8	93.0	95.0
Senior Secondary Education*				
Enrollment	Million persons	46.24	45.00	47.00
GER	%	79.2	87.0	90.0
Technical and Vocational Education and Training (TVET)				
Enrollment in Senior secondary TVET	Million persons	21.79	22.50	23.50
Enrollment in Tertiary TVET	Million persons	12.80	13.90	14.80
Tertiary Education**				
Total Enrollment	Million persons	29.79	33.50	35.50
On campus	Million persons	28.26	30.80	33.00
Of which Graduate Students	Million persons	1.40	1.70	2.00
GER	%	24.2	36.0	40.0
Continuing Education	Million person times	166.00	290.00	350.00

Source: State Council, 2010. Outlines of the *National Plan for Medium and Long Term Education Reform and Development 2010-2020*.

Annex 3: Conceptual Framework for Child Development from Birth to 6 Years of Age





Source: World Bank, 2004

Annex 4: Per Student Spending on All Major Subsectors in Education by Province, Municipality and Autonomous Regions, 2008

	GDP Per Capita (RMB)	Total ECDE Expenditure (RMB)	ECDE Budgetary Expenditure (RMB)	ECDE Budget as % of Total ECDE Spending	Primary Budget as % of Total Primary Spending	Junior Secondary Budget as % of Total Junior Secondary Spending	Sr. Second. Budget as % of Total Sr.Sec. Spending	Technical & Vocational Budget as % of Total TVET Spending	Tertiary Budget as a % of Total Tertiary Spending
Beijing	63,029	12757	6475	51%	76%	71%	68%	49%	48%
Tianjin	55,473	10982	6874	63%	88%	85%	63%	62%	52%
Hebei	23,239	1487	1042	70%	85%	85%	59%	61%	40%
Shanxi	20,398	1897	1211	64%	86%	82%	56%	67%	48%
Mongolia	32,214	6236	4002	64%	78%	81%	58%	72%	59%
Liaoning	31,259	10509	6477	62%	79%	80%	57%	53%	41%
Jilin	23,514	2646	1618	61%	79%	78%	58%	63%	56%
Helongjiang	21,727	5283	4355	82%	94%	91%	67%	79%	47%
Shanghai*	73,124	12247	8193	67%	83%	85%	59%	36%	52%
Jiangsu	39,622	2962	1378	47%	81%	75%	50%	44%	44%
Zhejiang	42,214	5356	2113	39%	75%	70%	42%	51%	43%
Anhui	14,485	1591	912	57%	81%	81%	43%	52%	45%
Fujian	30,123	2904	1669	57%	77%	78%	55%	53%	41%
Jiangxi	14,781	3140	1740	55%	83%	84%	55%	69%	39%
Shandong	33,083	2117	901	43%	90%	88%	53%	61%	46%
Henan*	19,593	2113	1273	60%	85%	84%	50%	68%	42%
Hubei	19,860	2575	1477	57%	86%	85%	41%	53%	41%
Hunan	17,521	2685	1118	42%	77%	76%	41%	58%	41%
Guangdong	37,589	5153	2065	40%	76%	76%	56%	58%	62%
Guangxi	14,966	1198	662	55%	91%	87%	54%	69%	55%
Hainan	17,175	1824	1061	58%	87%	78%	67%	87%	56%
Chongqing	18,025	2384	1118	47%	71%	72%	49%	54%	39%
Sichuan	15,378	1347	638	47%	72%	70%	44%	53%	37%
Guizhou	8,824	1562	1106	71%	92%	89%	64%	70%	55%
Yunnan	12,587	1732	1056	61%	79%	85%	56%	63%	57%
Tibet	13,861	3480	1932	56%	94%	96%	91%		83%
Shaanxi	18,246	2649	1932	73%	89%	87%	58%	63%	44%
Gansu	12,110	2133	1647	77%	87%	89%	63%	75%	54%
Qinghai	17,389	4794	3103	65%	84%	85%	72%	77%	62%
Ningxia	17,892	2429	1393	57%	87%	86%	61%	68%	77%
Xinjiang	19,893	2880	1888	66%	80%	78%	65%	72%	52%

Source: China Educational Finance Statistical Yearbook, 2009

Annex 5: Fee Structure of one-Year Pre-school Classes in Selected Provinces, 2009

Province	Fees						Fee Standard				
	Public			Private			Public		Private		Duration of fees
	Average	Maximum	Minimum	Average	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	
Jiangsu											
City	1520	2087	800	2978	5332	864	2061	849	5651	999	
Towns	1180	1723	686	1387	2284	701	1783	706	2378	780	
Rural	880	1327	427	969	1613	569	1503	477	2165	634	
Liaoning	141	980	30	269	2000	35	550	30	2350	40	Monthly
City	220	980	40	427	2000	40	550	40	2350	40	
Towns	120	400	40	160	500	35	230	40	400	40	
Rural	83	350	25	121	360	40	200	30	200	40	
Hebei	820	1600	40	3425	6800	50	1600	40	6000	50	
City	855	1600	110	3445	6800	90	1600	110	6000	90	
Town	505	970	40	2065	4080	50	950	40	4080	50	
Rural	290	540	40	1075	2100	50	950	40	1500	50	
Hubei	770	1343	197	2203	4183	223	1800	257	3423	213	
City	1115	2050	180	4660	9000	320	2050	320	6250	320	
Town	780	1300	260	1600	3000	200	1300	300	3000	200	
Rural	415	680	150	350	550	150	2050	150	1020	120	
Guangxi											
City	2120	3500	740	7050	13600	500	4000	740	13600	500	
Town	1313	2400	225	2350	4500	200	2400	225	4800	200	
Rural	853	1600	105	1045	1890	200	1600	105	3000	200	
Chongqing									To follow instruction from MOE		
City	367	595	130	288	480	65	250	50			
Town	148	310	52	134	230	41	250	50			
Rural	89	161	32	107	250	41	250	50			

Annex 6: Monthly Tuition Fees in Public Kindergartens in Shaanxi 2008

Type of Services			Unit	Standard
Fees for ECDE	Provincial level demonstration kindergarten	Whole day	RMB/person/month	130
		Boarding		180
	Type 1 Kindergartens	Whole day	RMB/person/month	90
		Boarding		130
	Type 2 Kindergartens	Whole day	RMB/person/month	70
		Boarding		100
	Type 3 Kindergartens	Whole day	RMB/person/month	50
		Boarding		75
	Not yet classified	Whole day	RMB/person/month	35
		Boarding		55

Source: Shaanxi Price Bureau website

Annex 7: Guangzhou Public Kindergarten Sponsorship Fees, 2008

Name of Kindergarten	Type	Sponsorship	Explanation
Huanghua Road Kindergarten	Provincial level Type 1.	Beyond the fees, RMB15,000 per four years	Full-time care RMB800-1,000/month
Guangzhou Municipality Kindergarten	Provincial level Type 1	RMB5,000/year	
Provincial Kindergarten Number 1	Provincial level Type 1	RMB10,000/year	Under 3 years of age charge only RMB5,000/year
Provincial kindergarten Number 2	Provincial level Type 1	RMB12,000/year	
Guangzhou Municipality Number 1	Provincial level Type 1	RMB10,000/year	
Academy of Science Kindergarten	Provincial level Type 1	RMB12,000/year	One time sponsorship fees
Little North Road Air Force Logistic Kindergarten	Municipality Type 1	RMB5,000/year	Once every four years
Kindergarten attached to South China Normal University	Provincial Type 1	RMB11,000/year for children and grandchildren of staff RMB15,000/year for outsiders	
Kindergarten attached to South China Agricultural University	Municipality Type 1	RMB3,000/year for children and grandchildren of staff; RMB5,000/year for outsiders	
Kindergarten attached to Chinan University	---	RMB12,000/4years for children and grandchildren of staff; RMB20,000/4 years for outsiders	
Kindergarten attached to South China Science and Technology University	—	RMB3,000/year for children and grandchildren of staff; RMB5,000/year for outsiders	

Source: <http://baby.sina.com.cn/news/2008-09-09/083734933.shtml> 2009-06-22, reported in Liu, 2009.

Annex 8: Regulation on the Facilities in Urban Kindergartens

	Sq. meters per room	6 classes □ 180 persons □		9 classes □ 270 persons □		12 classes □ 360 persons □	
		Number of rooms	Subtotal of sq. meters	Number of rooms	Subtotal of sq. meters	Number of rooms	Subtotal of sq. meters
1. Activity and other rooms							
Activity rooms	90	6	540	9	810	12	1080
Toilet	15	6	90	9	135	12	180
Storage for toys & materials	9	6	90	9	81	12	180
Music		1	120	1	140	1	160
Subtotal of space			804		1166		1528
Sq. meters per student			4.47		4.32		4.24
2. Office and related Rooms							
Office			75		112		139
Material & Conference		1	20	1	25	1	30
Making of materials & display		1	12	1	15	1	20
Health room		1	14	1	16	1	18
Morning inspection and reception		1	18	1	21	1	24
Guards' room	12	1	12	1	12	1	12
Storage room		3	36	4	42	4	48
Visit announcement room	10	1	10	1	10	1	10
Staff toilet			12		12		12
Subtotal of space			209		265		313
Sq. meters per student			1.16		0.98		0.87
3. Living Rooms							
Kitchen			54		61		67
Food storage room			15		20		30
Furnaces			8		9		10

Water boiler			8		10		12
Room for kitchen staff			13		18		23
Subtotal			98		118		142
Sq. meter per student			0.54		0.43		0.39
Total Floor Areas (sq. meters)			1111		1549		1983
Total space per student (sq. meters)			6.17		5.74		5.51
Buildings	K□0.61	985/1615		1400/2295		1807/2962	
Morning inspection, visitor's rooms, and living room	K□0.80	126/158		149/186		176/220	
Total constructed space (sq. meters/student)		1773		2481		3182	
Constructed space per student (sq. meters/student)		9.9		9.2		8.8	

Source: Zhou (2010).

Annex 9: Sampling of the Hunan Household Survey

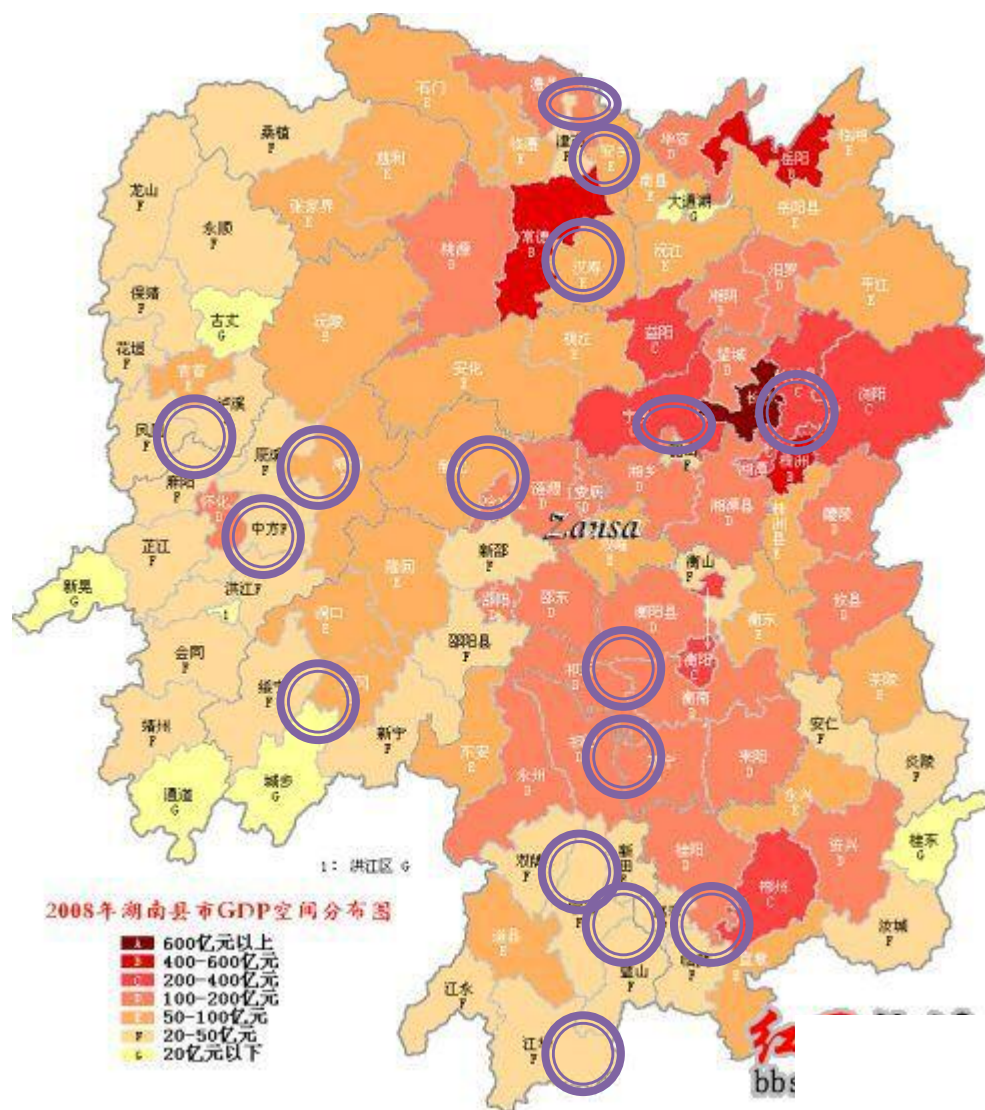
The sample comprises 17 counties in Hunan (of which 2 are ethnic minority autonomous counties in order to over sample minorities), 5 village-level units within each county (the urban equivalent is district in a city), and 20 households with children between 37 to 48 months of age within each village-level units. There are 1,700 households. (See the map of Hunan for the location of the sampled counties).

Sampling began by selecting the counties. All counties in Hunan were sorted first into three types (first urban districts, then county-level cities, then regular counties). Within each type, counties were sorted by GDP per capita from greatest to smallest. Then probability proportionate to size (PPS) sampling was employed. A cumulative population for each county was calculated by adding the population of each county to the population of all counties above it (after sorting the list as described above). A sampling interval was chosen by dividing the total population by the number of sampled counties. At first 15 counties were selected. A random number between 0 and 1 was multiplied by the sampling interval to obtain a random starting point. The county containing the cumulative population greater than but closest to the starting point was chosen as the first county. Then the next county was selected by adding the sampling interval to the starting point, and choosing the county whose cumulative population was greater than and closest to that sum. Remaining counties were chosen in analogous fashion. To ensure there are sufficient ethnic minority children in the sample, two additional minority autonomous counties were added after the first 15 counties were. There are a total of 17 counties.

In each county-level unit, 5 village-level units were sampled randomly with PPS where size is measured by population. There is no stratification at the village level. The villages were chosen using the `samplepps` command in STATA.

In each village-level unit (including urban neighborhoods), 20 households with children between 37 and 48 months were randomly sampled. In case where the number of households with e-year-olds fell below 20 and below 30, all households in the villages were sampled because there was no replacement if the selected households did not want to or unable to respond. The reason for selecting this age group is because they embody development in the first two years of age. Local staff of NPFPC prepared the list of such households for random selection. If the main caretakers of children cannot be found or refuse to participate in the survey, they were not be replaced in the sample.

Field testing was conducted in October 2009, and then again in February 2010. Training of three days was conducted in March 2010, to be followed by the full scale survey, carried out by 120 cadres of NPFPC. They were supported by a team from the Education Department of East China Normal University.



Annex 10: Mean and Standard Deviation of the Independent Variables

	mean	sd	obs
Weight at survey	15.90	3.07	800
Height at survey	97.55	6.24	800
Social Development Measurement	3.26	0.39	800
Cognitive Skill Measurement	0.56	0.24	800
Fine Motor Skills	0.62	0.40	800
Gross Motor Skills	0.62	0.39	800
Motor Skills	0.62	0.34	800
Age, measured by the number of months	46.46	6.49	800
Weight at birth	6.59	0.97	800
Female=1	0.47	0.50	800
Family size	4.39	1.35	800
Not raised by parents=1	0.34	0.47	800
HH income is 500-2000=1	0.04	0.19	800
HH income is 2000-4000=1	0.05	0.22	800
HH income is 4000-6000=1	0.06	0.24	800
HH income is 6000-8000=1	0.05	0.21	800
HH income is 8000-10000=1	0.15	0.35	800
HH income is 10000-15000=1	0.17	0.37	800
HH income is 15000-20000=1	0.16	0.36	800
HH income is 20000 or above=1	0.34	0.47	800
Rural region=1	0.62	0.48	800
Minority=1	0.09	0.28	800
Mother's education=Illiterate	0.02	0.12	800
Mother's education=Primary school	0.12	0.33	800
Mother's education=Middle school	0.54	0.50	800
Mother's education=High school	0.23	0.42	800
Mother's education=3-year college	0.07	0.25	800
Mother's education=4-year college or above	0.03	0.18	800
Caregiver's education=Illiterate	0.09	0.29	800
Caregiver's education=Primary school	0.24	0.43	800
Caregiver's education=Middle school	0.39	0.49	800
Caregiver's education=High school	0.19	0.39	800
Caregiver's education=3-year college	0.06	0.23	800
Caregiver's education=4-year college or above	0.03	0.18	800
Never read to kids=1	0.19	0.39	800
Read to kids 1-2 times per week=1	0.42	0.49	800
Read to kids more than 2 times per week=1	0.40	0.49	800
Never play with kids=1	0.45	0.50	800

Play with kids for less than 1 hour per day=1	0.42	0.49	800
Play with kids for 1-2 hours per day=1	0.09	0.29	800
Play with kids for more than 2 hours per day=1	0.04	0.19	800
Often punish=1	0.07	0.26	800
Sometimes punish=1	0.82	0.39	800
Never punish=1	0.11	0.31	800
Don't care about punishment=1	0.01	0.07	800
Attend Kindergarten=1	0.68	0.47	800
Attend qinzi class=1	0.19	0.39	800
Medical check every year=1	0.25	0.43	800
Medical check not every year=1	0.34	0.47	800
Never medical check=1	0.37	0.48	800
Unsure about medical check=1	0.03	0.18	800
Never watch TV=1	0.03	0.18	800
Watch TV for less than 1 hour per day=1	0.60	0.49	800
Watch TV for 1-2 hours per day=1	0.25	0.43	800
Watch TV for more than 2 hours per day=1	0.12	0.33	800
Eat meat or eggs every day=1	0.52	0.50	800
Eat meat or eggs every 2-3 days=1	0.28	0.45	800
Eat meat or eggs accidentally=1	0.12	0.33	800
Eat meat or eggs seldomly=1	0.08	0.27	800
Drink milk every day=1	0.41	0.49	800
Drink milk every 2-3 days=1	0.15	0.36	800
Drink milk once a week=1	0.04	0.20	800
Drink milk seldomly=1	0.24	0.43	800
Never drink milk=1	0.16	0.37	800
Eat fruit every day=1	0.50	0.50	800
Eat fruit every 2-3 days=1	0.21	0.41	800
Eat fruit accidentally=1	0.21	0.41	800
Eat fruit rarely =1	0.08	0.27	800
Never add calcium=1	0.24	0.42	800
Add calcium=1	0.74	0.44	800
Unsure about adding calcium=1	0.03	0.17	800
Immunization whether free or not=1	0.79	0.41	800
Immunization only when it is free=1	0.18	0.38	800
Never immunization=1	0.02	0.14	800
Unsure about immunization=1	0.02	0.12	800

Annex 11: Final Results of Multivariate Analysis

	(1) Weight	(2) Height	(3) Social	(4) Cognitive	(5) Weight	(6) Height	(7) Social	(8) Cognitive
Age, measured by the number of months	0.009 (0.015)	-0.010 (0.031)	-0.001 (0.002)	0.001 (0.001)	0.005 (0.016)	-0.028 (0.031)	-0.001 (0.002)	0.000 (0.001)
Weight at birth	0.457 (0.105)***	0.964 (0.216)***	0.023 (0.015)	0.000 (0.008)	0.435 (0.108)***	0.865 (0.214)***	0.020 (0.015)	-0.004 (0.007)
Female=1	-0.437 (0.197)**	-1.229 (0.405)***	-0.010 (0.028)	0.032 (0.014)**	-0.433 (0.203)**	-1.321 (0.404)***	-0.016 (0.029)	0.038 (0.013)***
Family size	-0.018 (0.080)	-0.165 (0.164)	-0.024 (0.011)**	-0.002 (0.006)	-0.022 (0.081)	-0.136 (0.161)	-0.032 (0.012)***	-0.006 (0.005)
Not raised by parents=1	0.175 (0.305)	0.572 (0.626)	-0.062 (0.043)	-0.012 (0.022)	0.180 (0.323)	0.536 (0.641)	-0.055 (0.046)	0.005 (0.021)
HH income is 2000-6000=1	0.175 (0.605)	1.113 (1.244)	0.036 (0.086)	0.105 (0.044)**	0.093 (0.621)	1.071 (1.232)	-0.001 (0.087)	0.075 (0.040)*
HH income is 6000-10000=1	0.095 (0.566)	1.152 (1.164)	0.062 (0.081)	0.064 (0.041)	0.096 (0.581)	1.342 (1.152)	0.039 (0.082)	0.033 (0.038)
HH income is 10000-15000=1	0.627 (0.563)	1.510 (1.157)	0.111 (0.080)	0.064 (0.041)	0.501 (0.582)	1.230 (1.155)	0.070 (0.082)	0.030 (0.038)
HH income is 15000-20000=1	0.847 (0.571)	0.997 (1.173)	0.071 (0.081)	0.140 (0.041)***	0.704 (0.592)	0.814 (1.174)	0.008 (0.083)	0.094 (0.038)**
HH income is 20000 or above=1	0.451 (0.563)	1.473 (1.158)	0.137 (0.080)*	0.101 (0.041)**	0.378 (0.585)	1.211 (1.160)	0.074 (0.082)	0.042 (0.038)
Rural region=1	0.880 (0.687)	1.106 (1.412)	0.047 (0.098)	0.047 (0.050)	0.900 (0.701)	0.852 (1.390)	0.066 (0.099)	0.030 (0.046)
Minority=1	0.517 (0.520)	2.388 (1.068)**	0.022 (0.074)	0.014 (0.038)	0.523 (0.561)	2.651 (1.112)**	-0.026 (0.079)	-0.044 (0.037)
Mother's education=Primary school	0.636	-2.366	-0.125	0.011	0.616	-2.407	-0.121	-0.011

	(0.870)	(1.788)	(0.124)	(0.063)	(0.884)	(1.753)	(0.126)	(0.058)
Mother's education=Middle school	0.621	-2.081	-0.139	0.044	0.670	-2.100	-0.146	0.018
	(0.844)	(1.734)	(0.120)	(0.061)	(0.860)	(1.707)	(0.123)	(0.057)
Mother's education=High school	0.963	-1.712	-0.138	0.093	0.900	-1.934	-0.170	0.052
	(0.904)	(1.858)	(0.129)	(0.065)	(0.922)	(1.830)	(0.131)	(0.061)
Mother's education=3-year college	0.854	-1.172	0.033	0.174	0.393	-2.350	-0.023	0.091
	(1.035)	(2.128)	(0.148)	(0.075)**	(1.078)	(2.138)	(0.153)	(0.071)
Mother's education=4-year college or above	1.820	-0.720	-0.051	0.138	1.560	-1.291	-0.145	0.059
	(1.194)	(2.453)	(0.170)	(0.086)	(1.238)	(2.456)	(0.176)	(0.082)
Caregiver's education=Primary school	0.396	1.266	-0.045	0.066	0.427	1.345	-0.051	0.039
	(0.420)	(0.863)	(0.060)	(0.030)**	(0.437)	(0.866)	(0.062)	(0.029)
Caregiver's education=Middle school	0.436	1.726	-0.082	0.104	0.549	1.793	-0.108	0.050
	(0.463)	(0.952)*	(0.066)	(0.034)***	(0.481)	(0.954)*	(0.069)	(0.032)
Caregiver's education=High school	0.387	1.497	-0.099	0.096	0.524	1.938	-0.108	0.039
	(0.572)	(1.176)	(0.082)	(0.041)**	(0.593)	(1.176)*	(0.085)	(0.039)
Caregiver's education=3-year college	0.715	2.579	-0.179	0.090	1.264	3.032	-0.190	0.066
	(0.822)	(1.690)	(0.117)	(0.060)	(0.858)	(1.701)*	(0.122)	(0.057)
Caregiver's education=4-year college or above	0.648	3.067	-0.049	0.126	0.872	3.165	0.017	0.114
	(0.977)	(2.007)	(0.139)	(0.071)*	(1.026)	(2.036)	(0.146)	(0.068)*
Attend Kindergarten=1					0.682	1.440	0.093	0.127
					(0.273)**	(0.541)***	(0.039)**	(0.018)***
Attend qinzi class=1					0.208	-0.568	-0.051	0.050
					(0.322)	(0.639)	(0.046)	(0.021)**
Getting knowledge of early childhood education from TV=1					-0.206	0.396	-0.013	0.031
					(0.247)	(0.490)	(0.035)	(0.016)*
Eat meat or eggs every day=1					0.714	0.336		
					(0.413)*	(0.820)		
Eat meat or eggs every 2-3 days=1					0.413	-0.562		
					(0.418)	(0.830)		
Eat meat or eggs accidently=1					-0.235	-0.265		

	(0.459)	(0.911)		
Drink milk every day=1	0.047	1.094		
	(0.371)	(0.736)		
Drink milk every 2-3 days=1	-0.151	-0.168		
	(0.401)	(0.795)		
Drink milk once a week=1	0.397	2.287		
	(0.590)	(1.170)*		
Drink milk seldomly=1	-0.438	0.358		
	(0.347)	(0.687)		
Add calcium=1	0.053	-0.489		
	(0.270)	(0.535)		
Unsure about adding calcium=1	0.410	1.574		
	(0.673)	(1.334)		
Watch TV for less than 1 hour per day=1	0.699	2.193	0.179	0.131
	(0.578)	(1.147)*	(0.082)**	(0.038)***
Watch TV for 1-2 hours per day=1	0.815	3.007	0.178	0.141
	(0.598)	(1.186)**	(0.085)**	(0.039)***
Watch TV for more than 2 hours per day=1	0.964	3.416	0.151	0.167
	(0.639)	(1.267)***	(0.091)*	(0.042)***
Medical check every year=1	0.036	0.697	0.086	0.064
	(0.356)	(0.706)	(0.050)*	(0.023)***
Medical check not every year=1	0.271	0.312	0.063	0.022
	(0.309)	(0.612)	(0.044)	(0.020)
Unsure about medical check=1	0.532	-1.940	0.017	0.003
	(0.628)	(1.246)	(0.086)	(0.040)
Eat fruit every day=1	-0.184	-0.833		
	(0.415)	(0.824)		
Eat fruit every 2-3 days=1	0.213	-1.062		
	(0.439)	(0.870)		
Eat fruit accidently=1	0.493	0.107		
	(0.429)	(0.850)		

Immunization whether free or not=1					-1.363 (0.847)	-2.221 (1.679)	-0.072 (0.120)	0.079 (0.055)
Immunization only when it is free=1					-1.172 (0.875)	-2.614 (1.735)	-0.134 (0.124)	0.069 (0.057)
Unsure about immunization=1					0.667 (1.131)	-1.648 (2.242)	-0.192 (0.161)	0.081 (0.074)
Read to kids 1-2 times per week=1							-0.058 (0.046)	0.051 (0.021)**
Read to kids more than 2 times per week=1							0.002 (0.051)	0.125 (0.024)***
Play with kids for less than 1 hour per day=1							0.067 (0.035)*	0.013 (0.016)
Play with kids for 1-2 hours per day=1							0.081 (0.057)	0.000 (0.026)
Play with kids for more than 2 hours per day=1							0.099 (0.080)	-0.042 (0.037)
Sometimes punish=1							0.093 (0.058)	-0.025 (0.027)
Never punish=1							0.082 (0.072)	-0.039 (0.033)
Don't care about punishment=1							-0.003 (0.216)	0.034 (0.100)
Constant	13.173 (3.114)***	90.731 (6.400)***	2.924 (0.444)***	0.098 (0.225)	9.642 (3.279)***	97.321 (6.503)***	3.558 (0.467)***	0.533 (0.216)**
Observations	803	803	803	803	786	786	786	786
R-squared	0.33	0.35	0.21	0.44	0.37	0.40	0.25	0.56

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Annex 12: TV Programs for Children and Youths in China

1. Central Television Station

Channel CCTV-15 is dedicated to programming for children and youths. It began broadcasting in December 28, 2008. The core operating principle is based on respect for children's rights, support for children and youth to develop their full potential, provide guidance for children's healthy development, and to provide a happy living space for them. The programming aims to be healthy, interesting, good for cognitive development and educational.

Main programs:

06:00 Cartoon City: Little Friends' playground

06:30 Big Windmill: TV magazine for youths

07:00 Happy Sky Flipping Cartoon

08:00 Silver River Drama

09:00 Cartoon Dream Workshop

09:30 Open Sesame: Scientific Playground

10:00 Cartoon City: Little Friends' Playground

10:30 Little Wisdom Tree: Integrating education with play

11:00 Happy Sky Flipping Cartoon

13:30 Wisdom Speed Car

2. Beijing TV Channel for Children

06:19 Cartoon

06:42 Mobilization of Toys (1)

06:50 Digital Baby

08:20 Precious Fruit Special

08:50 Happy Lamb and Grey Wolf (60th session)

09:20 Happy Lamb and Grey Wolf (61st session)

09:50 Happy Lamb and Grey Wolf (62nd session)

10:20 Happy Lamb and Grey Wolf (63rd session)

10:50 Happy Lamb and Grey Wolf (64th session)

11:20 Happy Lamb and Grey Wolf (65th session)

11:50 Happy Lamb and Grey Wolf (66th session)

12:20 Happy Lamb and Grey Wolf (67th session)

12:50 Mobilization of Toys (2)

12:55 The World of Cartoon

13:25 Classical Cartoon (1)

13:55 Classical Cartoon (2)

14:25 Dragon King Warrior of Dinosaur Baby (1)

14:55 Dragon King Warrior of Dinosaur Baby (2)

15:25 Dragon King Warrior of Dinosaur Baby (3)

17:00 Made in China: Kungfu Panda (1)

17:30: Soccer Player of the Song Dynasty

3. Shanghai Oriental Channel for Children

The Program, known as “Happy Jumping” is designed for children aged 3-6. Since its broadcasting in March 1996, it has over 800 programs and is a very popular and influential program. In July 2004, it has become an official children’s channel.

Program objective: Cultivate brave, self-confident, and expressive children
 Program slogan: No need for rehearsal, every child is a good actor
 Four principles:

- “Children tell the truth” : They express their own view of life, and build their self-confidence.

- “Jumping and hopping” : This does physical exercise, accompanied by music, and brings children to a world where they can stretch and expend their energy.
- “You ask and I answer” : This is a dialogue between children, and between children and parents. This put children on an equal basis with parents and facilitates their understanding and trust.
- “Play and game” : Own-created games to let children do what they normally do not do. Through these games, they learn knowledge, and establish the concept of physical labor and make them more confident and more creative.

This program aims to use play in a happy setting, to develop children’s creativity and imagination, and build confidence.

4. Hunan Golden Eagle Cartoon

07:00 Roll call for flying

07:15 Happy Party

07:25 Adventure of Star Fox (Tuesday/Wed), Water Baby’s 10,000 Why? (Monday/Tuesday)

07:45 Playing names

08:00 Happy Du Du

12:00 The Adventure of Lolo

12:50 Models from East and West

13:20 Kungfu Mobilization

13:30 The Adventure of Naja

16:15 Name Game

16:30 Happy Party

17:00 Cartoon Mountain Cat

17:30 Flying Playground

18:00 Electronic Boy

18:30 Iron Dragon

Evening Program

19:00 Ocean Baby Is Coming

19:45 Name Game

20:00 Mechanical Animal God

21:00 Flying Story House

All the above four channels aim to educate through entertainment and cultivate children's self-confidence and interest. On the whole, these are healthy programs.

The findings of the Hunan survey found that for TV has been acting as a substitute parent/caregiver in educating children.

Annex 13: Funding Sources and Coverage of ECDE in Selected Countries in North and South America, Europe, and Asia

Country	Source of Funds	Allocation Mechanism	Coverage
Brazil	<p><i>Expenditure</i> 3-6 years: 0.4% of GDP</p> <p><i>Funding sources</i> FUNDEB includes preschool education as an eligible level.</p> <p>Privately-funded provision is the most common option for 0-3 year old children.</p>	<p>0-6 years</p> <p>State and municipal revenue from taxes is allocated to public providers.</p>	<p><i>Day care/creches</i> 0-3 years: 11.7%</p> <p><i>Preschools</i> 5-6 years: 57%</p>
Colombia	<p><i>Funding sources</i></p> <ul style="list-style-type: none"> □ Payroll tax of 3% on all public, private and enterprises. □ The central government (Ministry of Education) and municipalities recently launched a joint fund (<i>Fondo de Fomento a la Atención Integral de la Primera Infancia</i>) to extend coverage to children under 5 in vulnerable conditions. 	<p>0-6 years</p> <ul style="list-style-type: none"> □ Payroll taxes are deposited in a central Bank account managed by a semi-autonomous institute (<i>Instituto Colombiano de Bienestar Familiar</i>). □ Budget line provided directly to public providers of pre-school services (age 5-6). 	<p><i>Integrated Services</i> 0-6- <i>Instituto Colombiano de Bienestar Familiar</i> 21% of age group</p> <p><i>Day care programs and preschool</i> 0-5 year-olds: 44% 5-6 year-olds: 86%</p>
Mexico	<p><i>Expenditure</i> 3-6 years 0.61% of GDP (0.52% public and 0.08% private)</p> <p><i>Funding sources</i> □ The Federal government covers 80% of the cost of public provision while parents cover the remaining 20%. Some states and municipalities also raise revenues to supplement funding.</p>	<p>0-6 years</p> <ul style="list-style-type: none"> □ 12 weeks paid maternity leave only for women working in formal sector and enrolled in social security. <p>National government allocates funds to states and municipalities.</p>	<p><i>Educación Inicial</i> 0-3 years: 3%</p> <p><i>Preschool (General, indigenous and community based)</i> 3 years: 25% 4 year: 81% 5 year old: 98%</p>
Czech Republic	<p><i>Expenditure</i> 3-6 years □ 0.46% of GDP (0.43% public and 0.03% private).</p> <p><i>Funding sources</i> □ Multiple sources including the regional school authority</p>	<p>0-2 years</p> <ul style="list-style-type: none"> □ Parental leave policies, including 28 weeks of paid maternity leave (69% of earnings) followed by a flat-rate, parental leave benefit paid until children reach their 4th birthday. 	<p><i>Family care/informal arrangements</i> 0-3 years: 99.5%</p> <p><i>Center-based creches</i> 0-3 years: 0.5%</p>

	(teacher's salaries, books and equipment), municipalities (running costs and capital investments) and from parental fees (capped at 50% of costs for the first two years and free	3-6 years - pre-schools <input type="checkbox"/> Budget line allocations to providers.	<i>Mateska skola/kindergartens</i> 3-6 years: 76-95%
Denmark	<i>Expenditure</i> 3-6 years <input type="checkbox"/> 2.1% of GDP <input type="checkbox"/> Parents cover 30-33% of the cost, with a sliding fee schedule based on need. <i>Funding sources</i> <input type="checkbox"/> Local authorities are responsible for funding.	0-6 years - kindergarten <input type="checkbox"/> Parental leave policies, 28 weeks paid at full employment and an optional additional 26 weeks paid at 60% of unemployment rate. <input type="checkbox"/> Local authorities finance providers. <input type="checkbox"/> Parents may also be provided with a grant to use the services of a free-choice child minder, recognized by the municipality	<i>Family day care</i> (kommunal dagpleje) & Center-based day care (vuggestuer) 0-1 years: 12% 1-2 years: 83% <i>Kindergarten</i> (bornehaver, aldersintegrerede institutioner & bornehaveklasse) <input type="checkbox"/> 3-5 years: 94%
Finland	<i>Expenditure</i> 0-7 years <input type="checkbox"/> 1.7% of GDP (1.1% family day care & center based care, 0.2% preschool class of 6-7 years and 0.4% home care allowance) <i>Funding sources</i> <input type="checkbox"/> State and local authority taxes <input type="checkbox"/> Parents cover 15% of the costs of day care, capped at EUR 200 per child per month, while pre-school education (6 year olds) is free.	0-7 years <input type="checkbox"/> Maternity leave policies, 18 paid at full employment plus 26 weeks paid at 66% of earned income. <input type="checkbox"/> Municipalities allocate funds to public or private providers for day care services, although parents can also access private child care allowances. The Ministry of Education receives a budget line for preschool education.	<i>Day care centers</i> (päiväkoti) & family day care homes/places 1-2 years: 27.5% 2-3 years: 43.9% 3-4 years: 62.3% 4-5 years: 68.5% 5-6 years: 73% <i>Pre-school (half-day for the academic year and are wrapped around by day care)</i> 6-7 years: nearly universal
United Kingdom (England)	<i>Funding sources</i> <input type="checkbox"/> Main contributors to funding are families 45%, nursery education 38% (public), Sure Start general grant 10% (public), child care tax credit 5% (public), and employers 2%. <input type="checkbox"/> Public provision is provided to families both in the form of free services and indirectly through	0-6 years <input type="checkbox"/> 26 weeks paid maternity leave paid at 90% of earnings for 6 weeks followed by a fixed rate for the remaining period. 26 additional weeks unpaid leave are available plus a further 26 weeks unpaid leave if a mother	<i>Child minders</i> / <i>Day nurseries</i> / <i>Playgroup</i> / <i>Children Centres</i> 0-3 years: 20% <i>Nursery Education / Reception Classes</i> 3-4 years: 96% 4-5 years: full

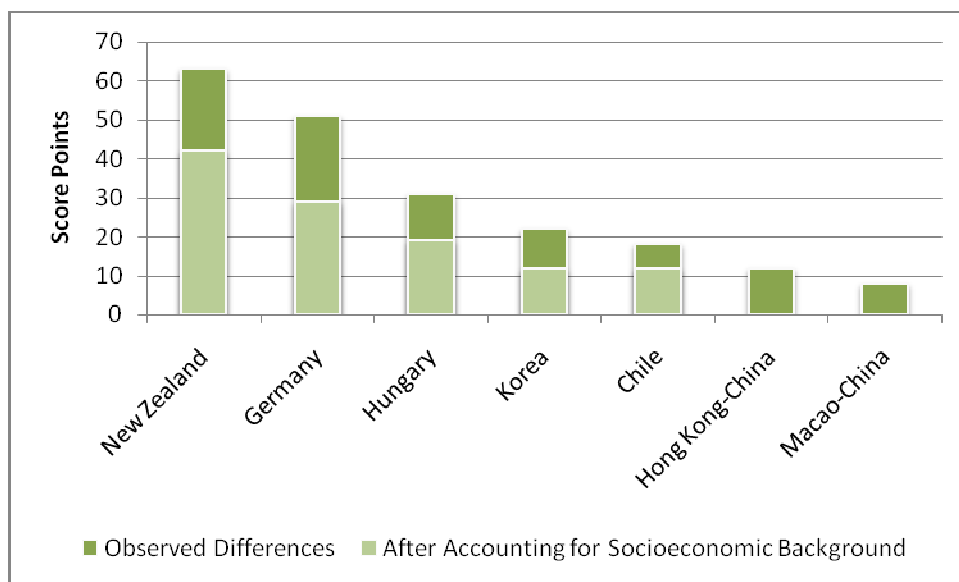
	<p>tax credits and grants that parents may use in any area of the marketplace. Fees in the child care sector are largely set by the market.</p> <p>□ Costs to parents vary greatly according to service provider, service type and income category. The average contribution of parents to child care is estimated to be 45% of full costs. Costs for low income and some middle-income parent may be covered to 80%, but parents using private child care and pre-school services (the majority) often pay full costs</p>	<p>has worked for an employer for more than 26 weeks.</p> <p>□ Public subsidy at provider and user levels. Providers receive start-up costs while families (based on need) receive tax credits through the Working Tax Credit Child Care Element.</p> <p>□ Public subsidies through grants/fees are paid to profit or non-profit providers, the latter being predominant in provision for children up to compulsory schooling.</p> <p>□ Tax and national insurance contribution exemptions for employer supported child care have been introduced; however, few employers provide assistance, financial or otherwise, to child care.</p> <p>□ A large part of the public sector subsidy (the Sure Start Grant) is channeled to Children's Trusts in Local Authorities, which commission and plan local services.</p>	<i>enrollment</i>
Thailand	<p>Funding Sources</p> <p>□ The government is the major funding source, although funds are also raised from private sectors, NGOs, communities, parents and external sources</p>	<p><i>0-6 years</i></p> <p>□ Budget allocations To central entities responsible for infrastructure, equipment, teacher and staff salaries, foods, utilities and basic operational expenses. Many Child Development Centres require monthly fees (varies by center) from parents to cover excess expenses such as meals, materials, and sometimes partial salaries</p>	<p><i>Kindergarten, preschool and child development centers</i></p> <p>4-6 years: 85%</p>

		for caregivers).	
United States	<p><i>Expenditure</i> 3-7 years <input type="checkbox"/> 0.4% of GDP</p> <p><i>Funding sources</i> <input type="checkbox"/> For childcare, the contribution is as follows: federal government 25%, state and local government 15% and parents the remaining 60%. Low-income parents pay on average 18% of family income per child enrolled in child care. <input type="checkbox"/> For preschool (3-6 years), approximately 34% comes from public sources and 66% from private sources, half of this being from household expenditure. <input type="checkbox"/> Federal funding is largely targeted on children with disabilities and children from low-income families. <input type="checkbox"/> States raise revenues using different schemes, including state lotteries</p>	<p><i>0-6 years</i> <input type="checkbox"/> For the Head Start program, the federal Government provides block grants to local agencies (“Head Start Grantees”) to offer services. <input type="checkbox"/> For the Child Care Development Fund, the federal government provides grants to states to subsidize child care costs for eligible families or improve the quality/availability of child care services. Some funds require matching contributions. In turn, states provide subsidies (certificates or in cash) to parents to purchase services <input type="checkbox"/> Disadvantaged/special needs</p>	<p><i>Day care / Child care</i> <input type="checkbox"/> 0-3 years: 38%</p> <p><i>Pre-kindergarten & kindergarten</i> 3-5 years: 56.4% 4 year old: 80% 5-6 years: 90%</p>

Source: Naudeau et al. 2010; Mexico coverage is based on Young, 2009.

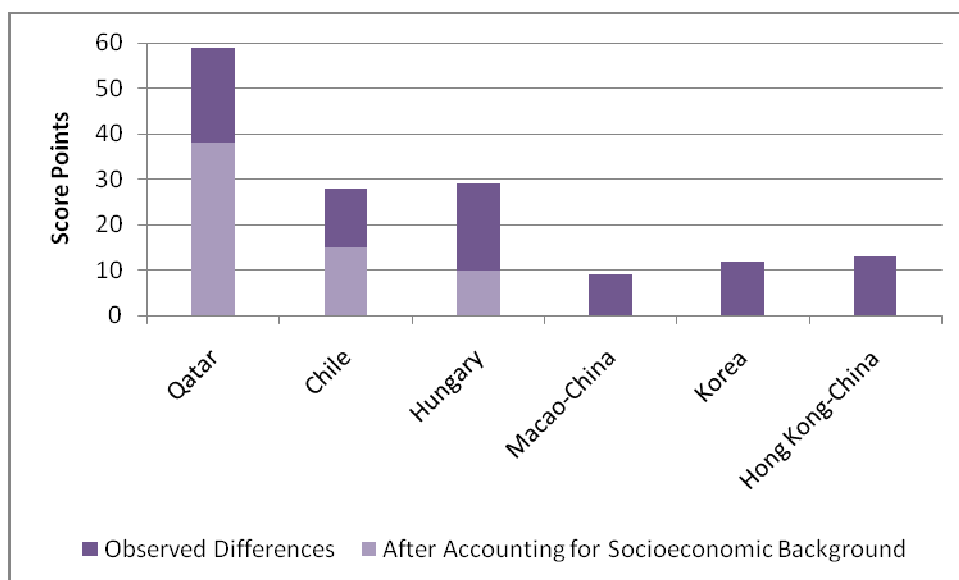
Annex 14: Impact of Parental Support in Early Ages on PISA Test Scores at 15 Years of Age

Annex 14a: PISA Score Point Differences Between Students whose Parents Read to Them in Primary School and Those Who Did Not.



Source: Schleicher presentation on PISA in Capital Hill on December 7, 2010.

Annex 14b: PISA Score Point Differences Between Students whose Parents Talked with Them about What They Had Done in Primary School and Those Who Did Not.



Source: Schleicher presentation on PISA in Capital Hill on December 7, 2010.